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VOLUME XII. NUMBER 1.

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CONTENTS.

ILLUSTRATIONS:	PAGE.
Standard Baggage Car—Atchison, Topeka & Santa Fe R. R.	5
Trussing a Freight Car Body-Bolster	9
Special Padlocks for Railways	3
Enos Varney, late M. C. B. of Fitchburg R. R. (Portrait)	1
Portable Forges	7
COMMUNICATIONS:	
Four and Six-Wheel Trucks	8
Passenger Car Decoration	8
EDITORIALS:	
The Anti-Railway Crusade	10
Fast Trains	11
Is There any Cause for Croaking?	10
English and American Railway Cars	10
MISCELLANEOUS:	
The Painting of Railway Passenger Cars	3
Peculiarities of European Railroads	6
Heating Cars by Friction	7
A New Freight Train Brake	7
MISCELLANEOUS:	PAGE.
New Boston & Albany Passenger Cars	6
Painting Back of Car Panels and Sheathing	3
The Pennsylvania Railroad—Scarcity of Cars	4
Railway Elliptic Springs	11
Independent Wheels—The Harrison Car Axle	4
The Way They Always Stopped	4
The Late Enos Varney	1
A New and Improved Car Roof	12
Master Car Builders' December Meeting	9

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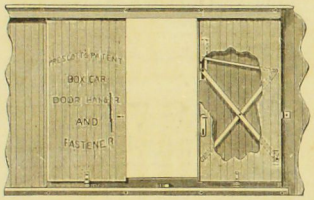

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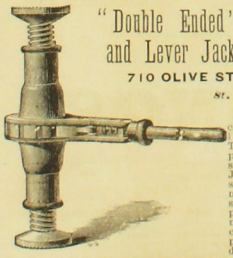

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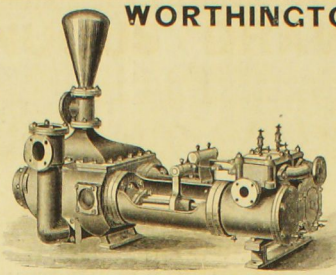

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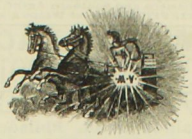

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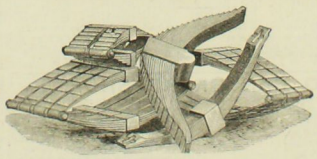
EXTRA TEMPERED,  LIGHT ELLIPTIC

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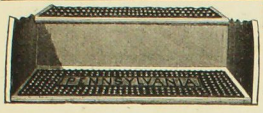

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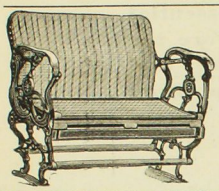

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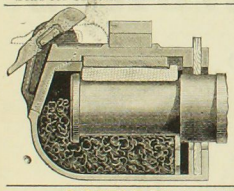

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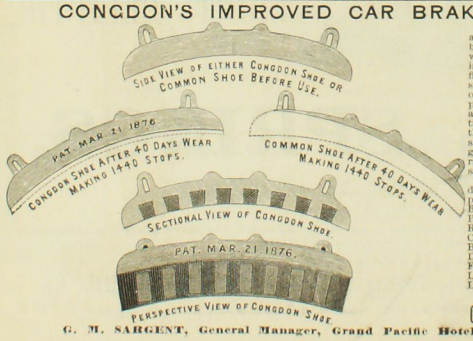

This improvement consists of a shoe, having imbedded in its body of cast iron, pieces of wrought iron, steel, malleable iron, or other suitable metal, fixed therein so as to appear in sections on the wearing surface of the shoe, which increases surprisingly its resistance to wear, and adds materially to the friction or adhesion of the shoe to the surface of the wheel. These shoes are now in extensive and general use on many prominent railroads, and are effecting a saving of over fifty per cent.

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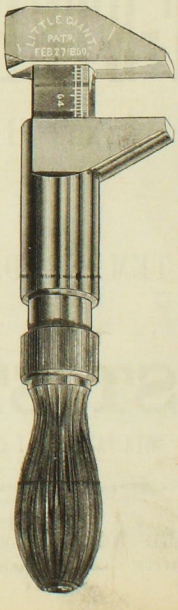

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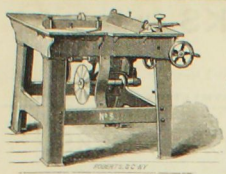

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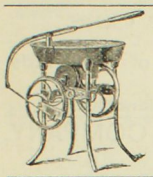

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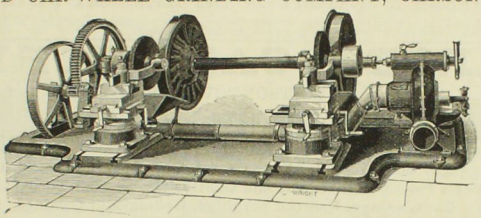

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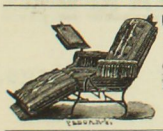

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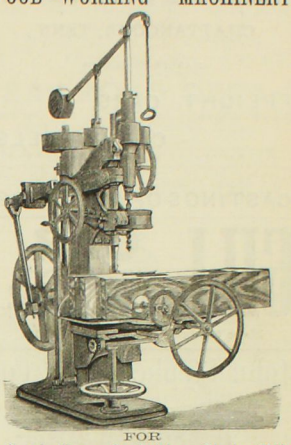

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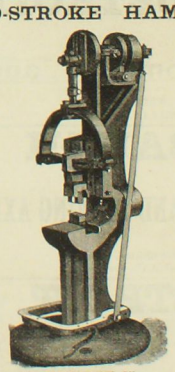

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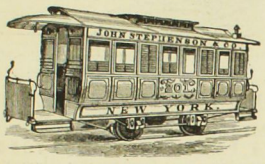

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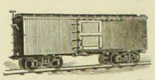

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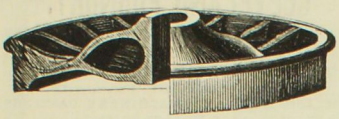

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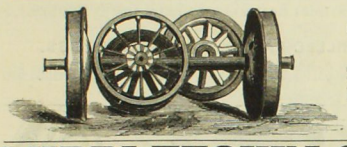

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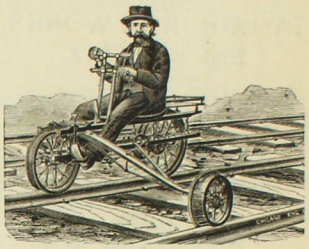

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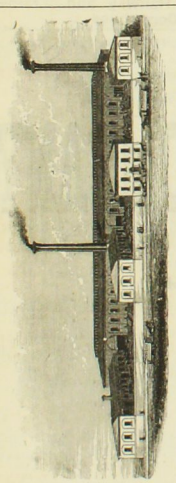

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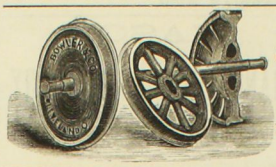

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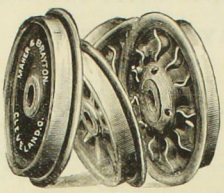

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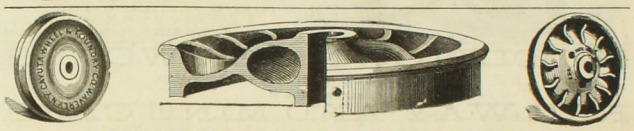

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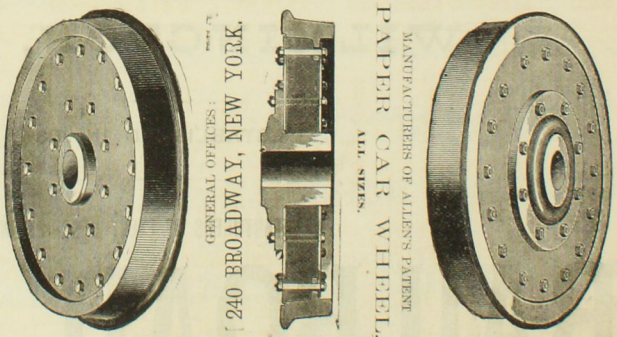

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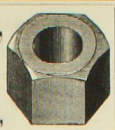

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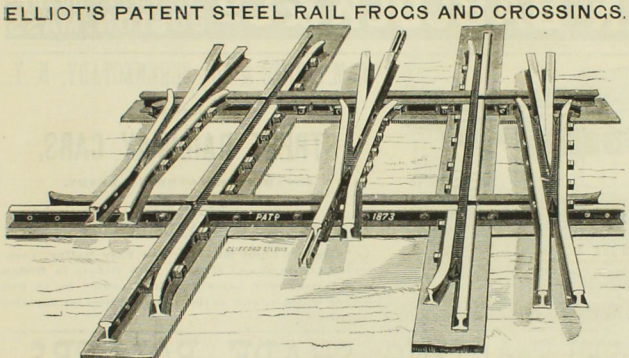

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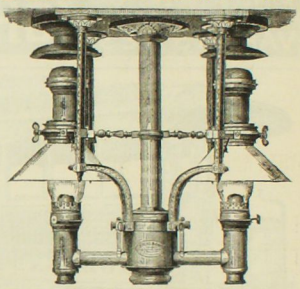

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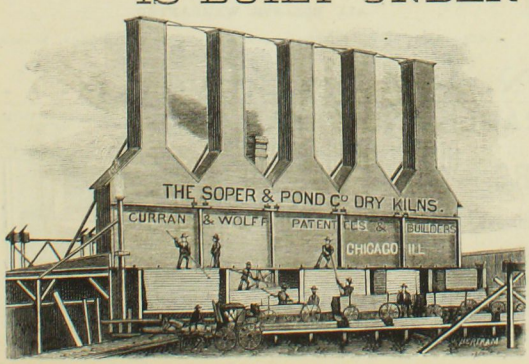

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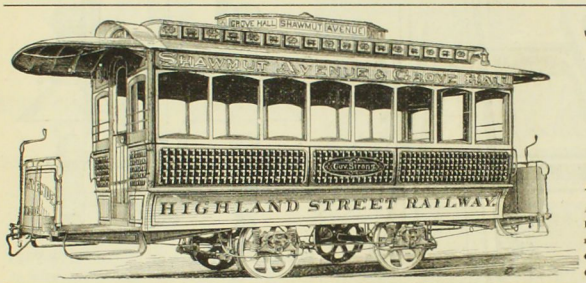

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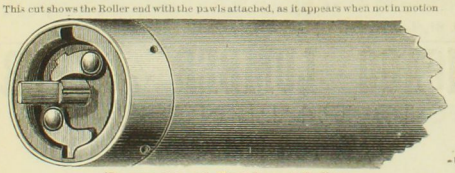
This cut shows the Roller end with the pawls attached, as it appears when not in motion



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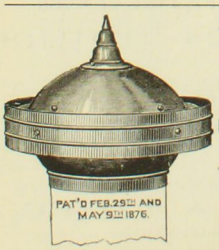

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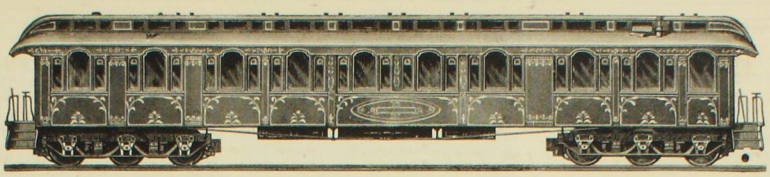
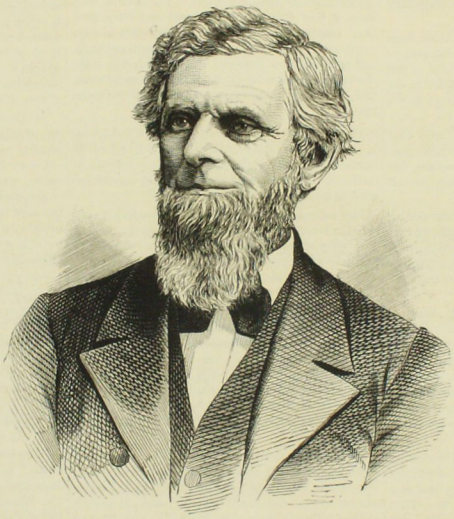


DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XII. } NUMBER I. }

JANUARY, 1881.

{SINGLE NUMBERS, TEN CENTS, $1.00 PER ANNUM.



E. Varney

Late Master Car-Builder of the Fitchburg Railroad.

[*Engraved expressly for the National Car-Builder.*]

Miscellaneous Items.

THE Columbus & Hocking Valley road has contracted with four car companies to take all the coal cars they can make during the month of December. The road has in use over 4,000 of their own coal cars, besides about 1,000 cars belonging to individual owners engaged in the coal business, and it is stated the mines are now only running on half time owing to the scarcity of cars.

THE Omaha shops of the Union Pacific have 560 men employed in the car department, and are extremely busy with repairing and new construction. About 700 men are employed in the locomotive department, where a like activity prevails.

THE Pan Handle shops at Dennison, Ohio, never employed as many machinists as at present, and never since the shops were built was there as much rebuilding and repairing of locomotives and freight cars as at present. Men are working night and day, but still they cannot turn out work fast enough to meet the demand.

A MEETING of the master car-builders on the Atlantic coast line was held at Welden, N. C., Dec. 18, and resolutions were adopted establishing uniform air-brake fixtures on all the roads of the line, the object being to prevent the flattening and breaking of wheels.

THE Bucyrus (O.) Machine Works have been purchased by some Cleveland parties, and will be converted into a car manufactory. Mr. John Thompson, for many years master mechanic in the railroad machine shops at Crestline, will probably be the superintendent.

A DISPATCH from Watertown, N. Y., says that the long pending suit of Westinghouse *vs.* Eames, for alleged infringements of air-brake patents, has been abandoned, the plaintiff withdrawing his action and paying costs.

THE Eastern (Me.) Railroad is preparing for an increased summer business, by the addition to its equipment of three Rhode Island engines, each weighing, in working order, 41 tons. The car shops at Salem are employed to their full capacity in building and repairing.

MR. D. F. VAN LIEW, of Aurora, Ill., has recently patented a car door hanger which is said to be very effectual. It is made of cast-iron, with no drilling or machine work, and is adapted to the present system, without change in most cases, except in using one instead of two side rails, besides saving the need of using a rail across the doorway to become bent or obstructed in winter—especially on stock cars.

THE Memphis & Little Rock Railroad shops at Argenta, Ark., in charge of Master Mechanic Thomas Rennell, are full of work. Two new passenger coaches have just been completed. They are 52 feet long, run on 6-wheel trucks, and are built of Arkansas woods only—pine, oak, poplar, walnut and ash. New freight cars are also being built to meet the increased demand for them on the road.

MR. J. H. F. WIERS, who for the last nine years has been General Master Car-Builder of the New York, Pennsylvania & Ohio (formerly Atlantic & Great Western) Railway, has resigned the position to accept that of Superintendent of the new Pullman Car Works, at Chicago. He entered upon his new duties on the 1st of January, and for the performance of which his acknowledged capacity and long experience eminently qualify him.

MR. HENRY R. WORTHINGTON, widely known as one of the most prominent hydraulic engineers in the country, and an extensive manufacturer of pumping machinery, died in New York, Dec. 17.

THE Missouri Car and Foundry Co. is building a sleeping car 50 feet long, and a dining car 45 feet long, for construction train service on the Gulf, Colorado & Santa Fe road.

IF space has not been annihilated between Cincinnati and St. Louis, it is no fault of the railways. They have pretty nearly annihilated the passenger fares, which is "catamount" to about the same thing.

MR. EPHRIAM N. WINSLOW, chief engineer and a director of the Old Colony Railroad, died in Boston, Dec. 5 of neuralgia of the heart, aged 57. He was for many years superintendent, engineer and treasurer of the Cape Cod Railroad, now a division of the Old Colony. He also projected and built the railroad and highway iron bridge across Taunton River, at Fall River, Mass., a work of great difficulty and magnitude.

MR. G. BENSON, foreman of the wood machine shop of the Missouri Car & Foundry Co., has resigned this position to take a similar one in the new Pullman Works at Chicago. Mr. Geo. T. Anderson, late of the Ohio Falls Car Co., has been appointed Mr. Benson's successor.

MR. JOHN MCCREA, formerly with the Michigan Car Co., Detroit, has been appointed superintendent of the Indiana Car Works, at Cambridge City, Ind., in place of Mr. John Higginson, resigned.

THE new advertising blotters of the Detroit, Saginaw & Bay City road are novel and attractive. One, bearing the legend of "Employés always courteous," represents a stylish lady with umbrella and small satchel, followed by the conductor with her baby, the agent with the bird-cage and shawl, and the baggageman with a three-story Saratoga trunk.

THE Wharton Switch Company, of Philadelphia, is building two quite extensive additions to its works to accommodate the increasing volume of business. The company is now several months behind in orders.

THE color-blind agitation having somewhat subsided, a learned German professor has discovered that engine-drivers on railroads are subject to peculiar affections of the ear. And no wonder. That infernal whistle would affect anybody's ears. Let a corps of scientific experts be organized at once by every railway to take the matter in hand.

A NEW project is broached for a fast line between New York and Philadelphia, consisting of a new air-line route, reducing the distance to 80 miles, with no grade crossings, and but two curves of 10,000 feet radius. The road is to be level, well drained, stone ballasted, and lighted by electricity. The regular running time between the cities is to be one hour.

THE firm of George W. Read & Co., dealers in hard wood lumber and veneers, 183 Lewis street, New York, was dissolved July 1, 1880, by the withdrawal of Mr. Samuel C. Hickey; and on the 1st of November a new copartnership was formed under the old firm name, consisting of Geo. W. Read, H. T. Bartlett and Wm. Macalister.

ACTIVE operations were commenced at the Swissvale (Pa.) car works on the 1st of December. They are under the management of Mr. John L. Gill, Jr., of Pittsburg, and have a capacity of turning out eight freight cars a day.

THE Harrisburg (Pa.) car works are running ten hours a day, with a force of 750 men and boys, and turn out 12 8-wheel freight cars per day. They have orders in hand sufficient to keep this force busy all winter.

THE Huntingdon (W. Va.) car works have commenced operations with a good supply of orders. Mr. John Kelly, formerly of Wilmington, Del., is superintendent.

THE Union passenger depot at Chicago, intended for the joint accommodation of the Pittsburg, Ft. Wayne & Chicago; Chicago, Burlington & Quincy; Chicago & Alton; and Chicago, Milwaukee & St. Paul roads, will be completed and ready for use by the first of February.

THE New York, New Haven & Hartford road is building at its Hartford shops 400 box cars, 300 of them being for Union Line, and the remainder for local use.

THE Miller platform, unlike a multitude of new and meritorious devices, needs no outside puffing to help it along. It puffs itself whenever a forward or rear collision occurs between passenger trains. Its life-saving record, in the aggregate, is far greater than most people suppose. There is no danger of its becoming obsolete when the patent runs out.

MR. E. BARNEY, senior member of the Barney & Smith Manufacturing Co., died at Dayton, Ohio, on the 15th of December. He was an old citizen of Dayton, and widely known among business men.

THE Missouri Car & Foundry Co., of St. Louis, are building 500 freight cars for the Chicago, St. Paul, Minneapolis & Omaha, and 300 for the Union Pacific.

PARTIAL and estimated reports of railroad earnings for the past year uniformly show a large increase over the previous year's earnings. It has indeed been a year of railroad prosperity, and there is every prospect that the boom will not only continue, but grow bigger during the present year. It is a *freight* boom though, and 50,000 more freight cars are wanted instanter. Car-builders will please hurry up, remembering the well-worn figure of speech about the hay and the sunshine.

ACCORDING to the San Francisco *Evening Post*, one of the features of railroad progress during the present year will be the enlargement of ticket-office windows, so that in moments of great provocation exasperated ticket-buyers can get at the pasteboard-stamping gorilla inside, pull him through the window, and hammer him over the head with canes and parasols, until he learns not to trifle with the feelings of the public by superciliousness and inattention.

THE Pratt & Whitney Co., of Hartford, Conn., is engaged in perfecting machinery and apparatus for the making of standard screw gauges, so as not only to give accurate measurements and size-gauges, but also true screws, and thread gauges ground to perfect pitch and size after being hardened. The apparatus and its productions will be ready for inspection in three or four months, and will, it is hoped, approximate perfection so nearly that there will no longer be any pretext for using a variety of standards, as heretofore.

DECISION has been rendered in the U. S. Circuit Court, at Chicago, in the famous barbed wire suits that have been pending for the last five years. The Washburn & Moen M'f'g Co. were plaintiffs, and claimed under the first patents, which involved the whole issue. The claim of plaintiffs was sustained, and infringers, manufacturers, dealers and users held liable for damages. The Glidden wire, and the Kelly steel barb wire, are the ones made under the patent.

THE Atchison, Topeka & Santa Fe road has contracted for the building of 2,500 freight cars, as follows: Litchfield Car Co., 250; Wells, French & Co., Chicago, 800; St. Charles (Mo.) M'f'g Co., 500; Missouri Car & Foundry Co., 350—all to have the Thielsen truck.

THE patent of the Huntingdon Track Gauge for railroads has been sold to Messrs. Crerar, Adams & Co., of Chicago, to whom parties requiring information in regard to it will apply.

THE C., C., C. & I. Railroad Company has decided to increase its equipment by 10 heavy Mogul engines and 1,000 freight cars, and contracts will be let shortly.

Painting the Back of Car Panels and Sheating.

At the last meeting of the Car Painters' Association, Mr. George Forby, of the Missouri Pacific road, read a paper on this subject, in which he says:

"As a matter of theory I would say paint the inside of car panels, and as a matter of practice I do it whenever I can, to prevent the absorption of moisture from the atmosphere. During long spells of wet weather unpainted wood absorbs water like a sponge, just the same as if it were thrown into a pool of water, though not to the same extent; but if the wood is painted the water will not reach it. So if the car panel is well painted inside and out, it may be exposed to a damp, drenching atmosphere for weeks, and the wood will remain perfectly dry, while if unpainted on the inside it will steadily absorb water with the most injurious results. The first effect is the swelling of the wood, followed by a proportionate shrinkage after the water has evaporated. This swelling and shrinkage is pretty sure to cause the checking or splitting of the panel. The evaporation seems to take place mostly if not entirely on the outside of the panel where the heat from the sun is greatest. The water makes its way through the wood to the outside of the panel, where it comes in contact with the paint. The adhesion of the paint to the wood is gradually weakened when, under the hot rays of the sun, it rises in blisters here and there where the wood is most porous, and the water rushes out of the wood to fill the blisters. If the blisters are pricked soon after rising, they will be found full of water; if they are allowed to remain unopened for a few days, and are then examined, they will be found dry and empty, which seems to indicate that the water has passed through the paint in the form of vapor. The adhesion of the paint to the wood has been weakened all over the panel, as you will find if you burn the paint off; it strips off readily with little heat, leaving nothing but the stain of the priming coat; or perhaps you level off the blister spots, touch up the paint, and varnish the panel all over; then if the job is run out in the sun before it is thoroughly hard, look out for a new and larger assortment of blisters.

"But it will be said that the evils I have pointed out do not always follow the neglect to paint the inside of the panels; that they are not even usually seen to follow such neglect. I admit this, and I think that the reason lies in the fact that in many cases the inside of the panel is almost hermetically sealed by the inner lining and paneling of the car. When this is the case, the damp air of which I have spoken does not come in contact with the inner surfaces of the panels, and thus we escape the penalties which would otherwise attend the absence of paint from those surfaces.

"Most of you have in the course of business to handle sleeping cars with paneled berth-fronts, such as are in the Pullman cars. You have noticed the tendency to checking and splitting there is, particularly in the centers. Some of this is no doubt owing to imperfect or faulty construction. A great deal of it is due to the excessive pressure they have to bear when forced shut with too much bedding inside. But I think that some of this splitting is owing to the fact that the inside of the birth is wholly unprotected by paint or varnish. I have often thought that if the inside of the berth had a heavy coat of oil paint, that we would see fewer splits on the outside. But I would not be understood as recommending this, as the odor arising from the paint, shut up as it would be most of the time, would permeate the bedding and be more objectionable, at least to passengers, than any number of cracks on the outside of the berths."

THERE is no truth in the report that Gen. McClellan has declined to accept the Presidency of the New York Underground Railway.

MR. E. B. MCCLURE has resigned his position as General Superintendent of the Indianapolis & St. Louis road, to take effect Jan. 1.

THE Old Colony Steamboat Co. have contracted for the building of a new steamer to ply between Newport and New York. It will cost nearly a million of dollars.

THE Harlan & Hollingsworth Co., Wilmington, Del., are building the first passenger cars ever made for a Spanish railway by other than English makers. They are for the Ferro-Carril de Vals a Villa Neuvay Barcelona, and they are built like American cars.

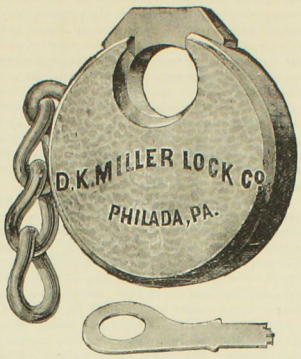


Fig. 1.

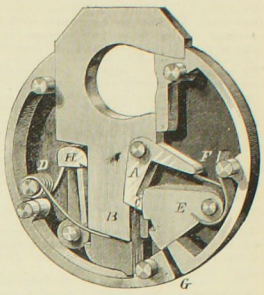


Fig. 2.

SPECIAL PADLOCKS FOR RAILWAYS.

THE engravings represent a novel form of self-acting padlock, manufactured by the D. K. Miller Lock Company, of Philadelphia. In its design and workmanship it is simple and convenient, while its durability is enhanced by the fact that it is made entirely of brass, except the springs, which are of phosphor bronze, a material superior to any other for this purpose. The pins at all movable joints are of wrought brass, so that injury from the weather is well provided against. Fig. 1 shows the exterior of the lock and its key. In fig. 2 the outer plate in removed in order to show the mechanism. *A* is the dog, which is so pivoted as to fit into a recess of the hasp, *B*, when the latter is pushed down. The end of the lower arm of the dog is formed with an angular projection *C*, which, engaging against a properly shaped shoulder at the bottom of the recess, holds the hasp in the position mentioned, in opposition to the upward tending force of one arm of the spring *D*. At *E* are the tumblers, either six or seven in number, according to the size of lock, all of which are pivoted on a single pin, and each provided with a bent phosphor bronze spring, as shown. The upper portion *F*, of one of these springs, instead of taking, as do the others, a position against the projecting part in the shell, is brought forward and under the straight arm of the dog, so that its tendency is to force the lower arm of the latter against the tumblers, causing the projection *C* to enter notches in the tumblers when the same are brought into proper position. It will be readily understood that, owing to the angle of the notches in the tumblers, and to the dog being in a solid piece, it is only when all the notches coincide that the projection can enter them. One of its important features is that no two locks are alike unless so ordered; the key that fits one, must be, and is, entirely useless to open another. This advantage is secured by varying the positions of the notches on the tumblers, so that in order to render all the notches coincident, a key having peculiarly formed projections and recesses at its extremity, must be employed, which, acting on all the tumblers simultaneously, lifts each the exact distance required. The key is merely pushed into the proper aperture, freeing the dog as above described, and allowing the hasp to be acted upon by the spring *D*, and so lifted upward into the position indicated by the dotted lines in fig. 2. Motion in this direction is then limited by the catch *H*.

The principle upon which these locks are constructed admits of millions of changes, so that no consumer will have a key like that of his neighbor. With all this possibility of difference, and, as if to continue every desirable feature, this padlock is made, when so ordered, to have a master or pass-key. The manufacturers also claim that no other padlock offers this feature.

This lock having been adopted by the United States Government, where it has now been eight years in service, and by a number of the leading railroad and express companies, we feel that our judgment in regard to its merits is confirmed by high authority, and, therefore, we have no hesitation in recommending it to the attention of our readers. We would particularly call the attention of railway presidents, superintendents and purchasing agents, to the merits of the switch and car locks manufactured by the above-named company. Their durability, simplicity and ease with which they can be operated, thus saving valuable time in changing the switch, render them particularly desirable, and, in fact, invaluable as a switch lock, while the security which they afford in the protection of freight cars will recommend them to all who will give them a trial. Although protected by letters patent, the protection which this company rests upon is that of superior merit and skill in the art of production.

Illustrated price list will be forwarded on application to the company, No. 821 Cherry street, Philadelphia.

The Painting of Railway Passenger Cars.

At the December meeting of Car-builders and others, held at the Association Rooms, 113 Liberty street, New York, an elaborate paper on car-painting was read by Mr. N. C. White, Editor of the *Painters' Magazine*, the leading points of which are embraced in the following synopsis:

The process of painting a passenger coach was grouped under four heads, namely, the wood-work priming, painting or coloring, and the finishing and varnishing.

The wood-work must be dry. Any surplus moisture endangers the protecting coats, and if the timber is green its decay is hastened by the paint. A semi-glazed surface was apt to be produced in some woods by the planing knives, and especially the resinous kinds, which prevents the thorough adhesion of the paint. Some painters sponge the wood-work with hot water before priming, which has the effect of leaving a better surface after the sandpapering.

Any defect in the priming endangers all the subsequent coats. As regards material, it should be of the best, and the ingredients thoroughly assimilated with one another. Good white lead and raw oil, with enough litharge or other dryer to avoid any fattiness of the oil, are the essential components. The patent primers, or those made by some vaunted secret formula, cannot be recommended. On the other hand, it is a mistake to suppose that a primer can be carelessly made or mixed. For the first coat, the lead is mixed with equal parts of oil and turpentine; for the second coat, two parts of turpentine to one of oil, and a small quantity of Japan. After puttying, sandpapering and leveling, a third coat of ground lead, reduced with turpentine, and a small quantity of japan or gold size is recommended. Some permanent color, such as ochre or umber, is usually added to the fourth coat. This process secures a hard-drying, thin,

compact and permanent surface. If a hard and quick-drying surface like varnish be applied to a coating rich in oil and slow-drying, the two coats shrink unequally, and the result is cracking and other devilties of which so much is said. An excess of turpentine in all the primary coats secures a flat surface, and the paint is thereby disseminated and made as thin as compatible with perfect covering. Japan being an ingredient as important as lead or oil, its chemical equivalents must be perfectly neutralized to avoid reaction, its drying properties nicely balanced, and it must have a good body and readily assimilate in mixing and grinding. The best is made from shellac as a base; but there are cheap shellacs and cheap ways of making japans. The only security against imposition was thorough testing, or buying of parties who are responsible and of good repute.

Oil should be sparingly used in the color coats, and on the other hand the coats should not set so quickly as to show brush-marks, or carry so much dryer as to injure the paint. Elasticity is a term not properly applicable to paint, which may be soft and elastic when first put on, and for some time afterward, but must ultimately become rigid and permanent. Each coat must be perfectly dry before the next one is applied, and dried in a proper temperature.

The comparative durability of light and dark body colors was an unsettled question and could only be solved by chemical science. It was unsafe to tint white lead with any color that had sulphur in it, because it produced a sulphide of lead, which was black. The orange pigments, arsenical yellows, massicot and red lead, were also dangerous in tinting white lead. The subject was an intricate one, but as to the relative durability of light and dark colors, it was his settled conviction that more depends upon the inherent qualities of the colors themselves than on their light or dark shade.

It was a general complaint among painters that reliable paints and colors were difficult to procure; and as for inspection and tests, they were not such as to enable the painter to distinguish between good, bad, and indifferent. The reputation and responsibility of the manufacturers were the only guarantees of quality, and he was pleased to state that Messrs. F. W. Devoe & Co., of New York, one of the oldest and best color manufacturing houses, had undertaken to supply the want so generally expressed. This firm has, by careful theory and experimental manipulation secured the best possible results in the way of permanent and reliable tints and intermediate or secondary colors used in the painting of railway cars—results of which the established reputation of the firm was a sufficient guarantee.

Independent Wheels—The Harrison Car Axle.

This device, designed by the inventor for securing a safe and practicable independent wheel movement for railway cars, seems to have made a very good record for itself on some of the horse street-car lines in Philadelphia. An illustrated description of it was published in the CAR-BUILDER in 1877, since which some important improvements have been made in its construction, which have made it stronger, better and cheaper. Its essential features, however, remain unchanged, and consist of a solid and continuous main axle, with one wheel pressed on in the usual way, while the other is rigidly pressed upon a sleeve which is held to gauge against a collar at or near the center of the axle. Briefly, it may be said that the axle is not divided, nor is there, strictly speaking, a loose wheel, except in connection with the sleeve which encircles half the axle, and revolves with the wheel. In regard to the performance of the axle, the following particulars are contained in a report made by Mr. Samuel Ford, the master mechanic of the Frankford & Southwark street railway, of Philadelphia, and dated Sept. 1, 1880:

Several of these axles have been in use on the line since July, 1879, and have given entire satisfaction. A new steam dummy car was at the same time fitted with one of these axles, with 36-inch wheels, in place of the truck with four 20-inch rigid wheels used under the other steam dummies, The wheel base was 8 feet. The axle was run steadily until August, 1880, when a careful measurement of the bearings showed that the wear was less than $\frac{1}{32}$ of an inch. The tires of the wheels having been broken by crossing the steam railway tracks, new wheels were pressed on sleeve and axle in one operation, under a 20-ton pressure, and the regular running was resumed the same day and has since continued without interruption. In October, 1879, a new car was equipped with the axles, and has run steadily for more than ten months, requiring no attention except oiling, and no outlay for repairs. They will shortly be put under six more new cars of this line. The cars using them have never left the rails. The wheels are made by A. Whitney & Sons.

Another report, by Chas. E. Emery, C. E., shows results of trials with dynamometer on a 40-foot curve of the Houston, West street & Pavonia Ferry Line, of New York. The resistance of a car with the Harrison axles (weight of car loaded, 5,725 lbs.) on a level curve of 40 feet radius, was 34.03 lbs. per ton; and the average of two cars with common axles (average weight loaded, 5,945 lbs.) 53.57 lbs. per ton, the proportion of resistance being 100 to 157.42, or 36.48 per cent. in favor of the independent wheels. The actual curve resistance with these axles and ordinary axles respectively is 22.23 lbs. and 41.77 lbs. per ton, or proportionately 100 to 187.9, so that the actual saving in the extra resistance due to a curve of 40-foot radius is 46.78 per cent., this percentage representing the actual saving in wear and tear of wheels and track, and the percentage of 36.48, as above, representing the saving in draft on the curve.

This evidence is very good as showing the advantages of independent wheels for street cars. Very few railroad mechanics, we imagine, would question their utility in this branch of service, and mainly because the element of *safety* is practically excluded. If an axle with independent wheels should break or get out of order while running under horse cars, or even under steam dummies on street lines, it would be attended with little or no danger, as the vehicle could be stopped at once. With steam cars, however, on regular steam lines, a broken axle is a vastly more serious matter, and may cause an almost instantaneous crash, attended with the usual horrors of a first-class railroad accident. The mere economy of independent wheels, the saving in wear and tear and draft power, is not of itself a sufficient inducement to warrant their general introduction on ordinary steam passenger trains. They must be safe as well as economical—as safe under all circumstances and contingencies as are the rigid wheels—and perhaps they are, or can be made so. But it is one thing for the inventor to see and be convinced of it, and another thing to persuade railroad managers to see it in the same way.

The Pennsylvania Railroad—Scarcity of Cars.

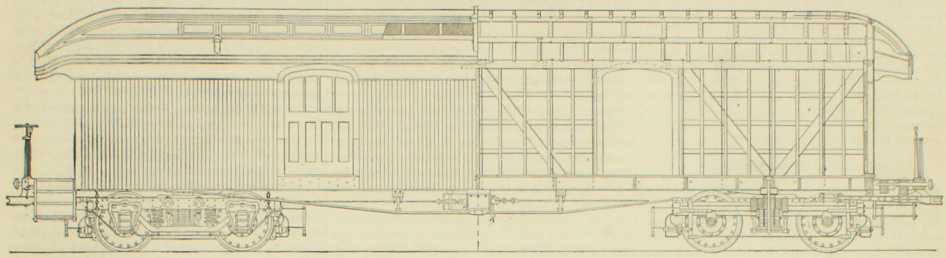
The annual official inspection of the main line and western connections of the Pennsylvania Railroad shows the whole of this extensive system to be in excellent condition. Many important improvements are in progress on the western lines. About two-thirds of the Pittsburg, Fort Wayne & Chicago line have been stone ballasted. The condition and financial prospects of all the lines were found to be highly satisfactory. The *Railway World* says, in this connection, that the only serious drawback or cause of complaint at any point arose from the lack of cars to meet the pressing demands of traffic, and this deficiency is so universal, not only on the lines operated by the Pennsylvania Railroad, but on the lines operated by all the other important railways of the country, that it forms the most noticeable feature of the present phase of transportation movements. Everywhere the cry comes up for more cars. Disputes about rates or alleged discriminations have been almost wholly quieted by the successful operation of the pooling system, which gives universal satisfaction to all well-disposed and intelligent merchants, and never encounters the slightest opposition except from parties who do not fully understand all its workings, or who desire to promote special and selfish personal interests. The car famine, which is now so severely felt, is due, on the lines operated by the Pennsylvania Railroad, rather to the exceptionally urgent and active demands of local traffic than to the requirements of through freight movements. The superior terminal facilities provided for through traffic have done so much to expedite the loading and unloading of cars, that vast quantities of freight can be moved between the great terminal points with a comparatively small number of cars, but as corresponding facilities for loading and unloading the cars engaged in many of the important branches of local traffic do not exist, numerous detentions are unavoidable, and the great increase which was suddenly made in the demands for this class of service has overtaxed the capacity of the existing equipment. Meanwhile, in all the car shops of the country cars are being constructed with unexampled rapidity.

The Way They Always Stopped.

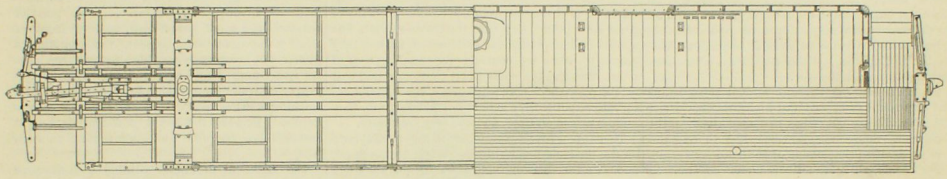
When railroads were first introduced, old Mrs. Quince, a venerable lady who lived in the pine woods region of Georgia, declared in a very positive manner that they were dangerous things, and she would never ride in the cars "no how." A year or two afterward she was suddenly called to visit a friend some thirty miles away. The roads being impassable, and no stages running, she must either go by rail or remain at home. Her family did their very best to influence her to take the cars, and finally succeeded. She was accompanied to the depot by her son-in-law, James Smith. He purchased her a ticket, and seeing her comfortably seated in the cars, exhorted her thus: "Now, mother, please make up your mind that, no matter what may occur, you will keep cool. The cars start suddenly, and they stop suddenly, and they pitch around and jerk tremendously, sometimes; but don't be disturbed, just make up your mind that you won't be. Now please promise me that you will keep cool, and then I shall have no fears about you." The old lady could not resist this plea, so she promised, fully determined that nothing should be allowed to trouble her. James bade her good-by, and the cars started. They went along very pleasantly for quite a while, and Mrs. Q. thought that riding on a rail was not so dreadful, after all. They had gone about sixteen miles, and were flying along at a fast rate. Passing through a deep cut, there was a curve in the road, and an immense rock had fallen from the ledge and landed upon the track; the engineer did not see the rock in time to stop the train, consequently a collision followed, which pitched the old lady over three seats. She gathered herself up, and smiling very complacently, again took her seat. After a while, the rock was removed and the train started on. The conductor, passing through the train, noticed the old lady looking so calm and composed, and remarked, "Madam, we came very near having a fearful accident." "Did you?" said the old lady, smiling. "Yes, it was a serious collision." "Have you had a collision?" she asked, in her sweetest tones. "Why, yes!" thundered the conductor "didn't you notice how suddenly the cars stopped?" "No," said the old traveler, quietly, "I didn't notice it; I thought that was the way they always stopped!"

THE Baltimore & Ohio Railroad Company has purchased the right to use the Griffith Middleton continuous draw-bar.

STANDARD BAGGAGE CAR—ATCHISON, TOPEKA & SANTA FE RAILROAD.



Side Elevation and Section.



Bottom of Floor Frame.

Floor and Roof.

DIMENSIONS AND SPECIFCATIONS.

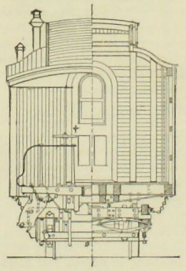
Length of Body outside of Siding.....	50 ft.		1⅝ in.
Width " " " "	9		9⅜
Height from under Sill to top of Plate....	7		7¼
Outside, Intermediate and Center Sills (2 of each), of clear Norway or yellow pine.....	.5	x 8 in.	x49 3
2 End sills, clear white oak	.6	x 8 in.	x 9 8
2 Needle beams " "	.4½	x 7 in.	x 9 8
4 Corner posts, ash.....	.5⅝	x 5½ in.	x 7 4½
8 Side door posts, ash.....	.4⅝	x 4⅝ in.	x 6 7½
4 End door posts, "	.4⅝	x 4⅝ in.	x 6 8¾
72 Intermediate posts, ash..	.1½	x 2½ in.	x 6 8¾
12 Side braces, " ..	.1½	x 7 in.	x 8 8½
4 End braces, " ..	.1½	x 5 in.	x 7 5
12 Side girths, " ..	.1½	x 3 in.	x11 7
6 " " ..	.1½	x 3 in.	x14 6
4 End girths, " ..	.1½	x 3 in.	x10 0
4 Side plates, yellow pine..	.5¼	x 3⅝ in.	x50 1⅝
2 End plates, oak or ash..	.2½	x19 in.	x 9 8
34 Rafters, each side, ash...	.2½	x 1¾ in.	x 2 8½
2 Deck sills, yellow pine....	.4¼	x 2 in.	x50 0
2 Deck plates, "	.2	x 3 in.	x50 0
33 Deck carlins, ash.....	.2	x 1½ in.	x 5 1½
4 Deck posts, "	.2	x 4 in.	x 0 13⅝
32 " " "	.2	x 3 in.	x 0 13⅝
4 " " "	.1¼	x 5 in.	x 0 13⅝
8 " " "	.1¼	x 3 in.	x 0 13⅝

CONSTRUCTION.

The End sills will be secured to ends of each long sill by two ¾x13 in. joint bolts, nuts to be let in 6½ inches from the shoulders of the side sill. The outside, intermediate and center sills to enter into end sills with double tenons and ¾x13 in. joint bolts.

The Needle-beams will each be secured to the sills by one ¾x12 in. bolt in each sill passing through sill and needle beams, all with nuts and washers on the under side. Each will have two ¾ in. truss rods.

Each Transom to be made of two wrought iron plates ⅜x12 in., the upper plate to have a lip ⅜x4 in. welded on each end to secure the ends of the bottom plate. The



End Elevation and Section.

transoms secured to each outside sill by three ⅝x11 in. bolts extending through outside sills. Ends of upper plate and truss rod clip with nuts on the under side. Side bearings to be secured to the upper and lower plate of transom by four ⅝ in. bolts.

The Center-plate will be secured to the transom by four ⅝x15 in. bolts, bolts to pass through center sills, draft timbers, transom and center plate, with nuts on under side of center plate.

There will be two ⅝x15 in. long bolts passing through intermediate sills, oak filling and transom, with nuts on under side.

The Draft-timbers will be fitted to receive the iron transoms, each timber to be secured to the center and end sills by 12 bolts, ⅝x16 in. long, four bolts passing through transom and center sills with nuts on under side, six bolts passing through carry lugs and center sills, two bolts passing through end sills.

There will be two Truss rods, 1⅛in. in diameter, running from each transom, with queen posts; queen posts and brace secured to needle-beams by four ⅞x3 in. lag screws.

There will be two center-pins, 1¾x3 ft. 2 in., solid head, ⅝x3 in., passing through block and transom plate, fitted level with floor.

There will be 11 Tie-rods, ⅝x9 feet 10 in., with nuts and washers each end, passing through each outside, intermediate and center sill, and placed in position as per drawing; 11 floor timber distance blocks, 1½x5 in., tenoned to side, center and intermediate sills.

Lining on under sides of car to be ⅞x5½ in. matched white pine, secured to under side of outside, intermediate and center sills with 8d. nails.

The Floor to be best quality yellow pine, from 6 to 8 in. wide, 1¼ in. thick, rabbitted together and secured at the crossing of each sill and at the ends with 20d. spikes. There will be between each post, resting on floor, a 2½x1 inch piece, well painted and secured by 8d. nails. The space between lining and floor to be filled in with dry pine shavings.

There will be on each side of body of car 14 rods, ⅝-x7 ft. 9 in. passing from top of plate to under side of sill, with nuts and washers on each end.

On each end of car will be 2 rods ⅝ in.x8 ft. 10 in., and 2 rods ⅝ in.x8 ft. passing from top of end carlin to under side of end sill, with nuts and washers on each end.

On each side of car will be 3 ribs 1½x3 in. framed and fitted to posts and braces, and secured by two 1¾ in. No. 16 screws in each post; also, 3 ribs on each end, 1½x3 in., secured in same way.

The Siding to be first clear, well-seasoned white pine, ⅛x5½ in., tongued and grooved, with bead in center of each board.

There will be thirty ⅝x19½ in. rods passing from top of deck plate through center of deck posts, and through deck sills, with nuts and washers on top, and head of bolt flush with under side of sills.

There will be 4 Iron Carlins, 3¼x2 in., resting on and secured to main plates by two ½ in. bolts.

The main and deck roof will be of ⅛x2¾ in. matched dry white pine secured by 1¾ in. No. 16 screws.

The inside lining to be clear white pine ⅛x5¼ in., tongued and grooved, with bead in center of each board.

There will be 4 side-doors of ash, 6 ft. 2 in. high, 4 ft.

4 in. wide, and 1⅝ in. thick, hung with standard pulley wrought-iron track 1x¾ in. lower track 1x1¾ in., cast iron; each door to have an elliptic cast-iron head.

There will be one door on each end of car, made of ash, and with cast-iron elliptic head.

Outside of car to have four coats of paint and one of varnish, and finished with two good coats of wearing body varnish. Roof to have two coats Asbestos paint; trucks (Thielsen), one coat mineral and two coats drab, striped, and one of heavy varnish; ceilings, three coats white lead and two of zinc in Demar varnish; rest of car inside, three coats of paint, grained oak, and one heavy coat of varnish.

The cars to have Thielsen Iron Trucks.

Peculiarities of European Railroads.

A London correspondent of the *American Machinist*, writes as follows:

In many things the United States is more advanced than Europe, while in others she might learn with advantage from the older countries. The first thing that strikes an American traveler on arriving on this side of the Atlantic is the condition of the English and continental railroads. Here the cars are called carriages; the depots, stations; no freight or freight cars, but goods and goods vans; no conductors, but guards; no switches, but shunts; no freight or box cars, all goods being carried on platform cars, with two-foot sides, covered in bad weather with tarpaulins. This applies to England, not the continent, where box or freight cars are the rule.

The cord running through all American trains and communicating with the engine-driver is not to be found here, but exists to some extent on the continent. Sometimes, however, here in England it is used along the outside of the train, and sometimes inside, along the floor, under the mat, in each compartment, on all passenger carriages here and on the continent, with the exception, as far as the writer's observation goes, of Switzerland, where a sort of composite form is in use. Under the seat of each compartment the cord passes through a ring, and there are printed instructions above directing that in case of trouble, the ring is to be pulled up; thus, it is to be inferred, a bell is rung on the engine. The objection made here to the American cord system is that, owing to the use of compartment cars and the consequent seclusion of the passengers, the cord would be pulled for a *lark*, and it would be impossible to detect the culprit. Any one who has had the misfortune to travel on a crowded train on a bank or other general holiday, could easily understand what might be done. What could some two or three "guards" do in a train of ten carriages of three compartments each? Electrical, pneumatic and telephone systems of communication have been invented, tried and abandoned, and the problem is yet unsolved.

In some things England appears to be more conservative than the continent. Here the caboose on the engines is open, as a rule, to the weather; across the Channel, as a rule, it is housed in. Here, as a rule, the engines have inside cylinders; there they have both kinds. They do not use anywhere in Europe the headlights so common at home, but instead, a poor affair of a lantern on each side, with not one-quarter the penetrating power. Another evidence of conservatism is that, when they have successfully proved the value of an invention, they do not generally adopt it for, perhaps, another generation. Continuous brakes have been used here for some time on a few trains, but the great majority have nothing more than the old hand brakes. Trains run every five minutes on the underground railroad in this city; some have continuous brakes, while the majority have not—if it is a good thing, why not adopt it? The Westinghouse automatic is making some headway, and there is some talk of passing a law compelling all trains to be so equipped. There are two disagreeable concomitants of railroad travel here. One is the violent slamming of the door in your face at each station as the train starts, and the other is the squeaky screeching of the brakes and wheels when coming to a stop. This is a greater nuisance than might be thought possible, and detracts much from the pleasure of traveling. As no attempt is made at ornament, the engines are black, unsightly affairs. How can any one take a pride in a thing he cannot make handsome, no matter how much he may rub or polish?

No baggage-checking system exists anywhere in Europe. They will label your trunk, and at the destination you must claim it, if, perhaps, some one else has not already done so before you—something that is quite possible. Travelers cannot understand why this system of checking is not introduced here, but they forget that there is not the same necessity for it. Generally, you are not detained more than ten minutes in pointing out your baggage to the railroad porter. The system of shunting or switching in use here, and but to a limited extent on the continent, is far in advance of the cheap live substitute we have in the States. The Saxby-Farmer block system is now known all over the world. Certainly, a plan by which one man can work the switches and signals day and night for 50 or more switches, is certainly worthy of general adoption. As a rule, the trains run at a fair speed—perhaps a little faster than with us, and they ought to, when we consider the small extent of trunk lines and the consequent character and cost of the permanent way; but from the writer's observation, while they generally start on time, they seldom arrive on time, but are very often late.

There are a few Pullman cars in use, particularly on the through lines running north to Scotland, and on a few lines on the continent; but they will never meet with the general adoption they have in America. There they were a necessity; here they are not. There the seats in the ordinary car are not adapted to night travel, as there is no support for the head; while all trains here have backs padded above the head, and with the exception of the second-class carriages in France and Belgium, are quite comfortable; and as the compartments are not generally crowded, it is quite possible to pass the night without discomfort.

New Boston & Albany Passenger Cars.

Some new passenger train cars have just been completed at the Allston shops of the Boston & Albany road, and consist of a drawing-room coach and several day passenger cars. They are now running between New York and Boston, and like most new cars built for important lines of travel, they present some features of construction that are worthy of special notice. That they are beautiful, costly, commodious, luxurious and attractive, as well as fully up to the mark in all the requisites of strength, safety and excellent workmanship, may be taken as a matter of course. Passenger car construction, in respect to what is substantial and ornamental, has reached a point which leaves but a small margin for any very important improvements. The introduction of new features is to a great extent limited to details that are relatively of minor importance, and it is upon these that the skill and taste of builders are now mainly expended. The cars referred to are an illustration of this. While they do not differ very materially from others of the same class that have recently been turned out of the shops of leading lines, they present, at the same time, some peculiarities in ornamental details, which will be noted in the description which follows.

The drawing-room car is 60 feet long inside. At one end is a smoking room about 12 feet in length, and between this and the main compartment are a lavatory and water-closet on one side, and a Baker heater and porter's closet on the other. The smoking room has two, and the main saloon seven windows on a side, with two high-back revolving chairs, upholstered in scarlet plush, to each window, making 36 seats in all. The windows are large, the glass being 40×36 inches. They have spring-roller shades, and heavy dark red satteen curtains, trimmed with old gold silk plush. The floor is laid with a costly Axminster carpet, of a Turkey rug pattern. There are plated foot-rests on each side near the floor.

The inside finish is somewhat peculiar, from the fact that it is entirely of mahogany, ceiling and all, unrelieved by moldings, carvings, veneers or scroll-work. This, although it impresses one with the intrinsic richness of the material, is at the same time rather somber and heavy, especially in the night, or when the car is standing in a covered station, as it was when we saw it, with much of the daylight shut out. We confess to a decided partiality for light-colored finish in passenger cars, either mainly, or as an agreeable relief to a prevailing dark ground. This, however, is a matter of taste, and if the great traveling public should vote upon it, the majority would very likely be against us. The car is lighted with Williams, Page & Co's four-light chandeliers. The metal furnishings are silver-plated. Between each pair of windows is a small parcel-rack, and in front of them is the usual arrangements for attaching a table. The lavatory is provided with a large copper water-tank placed overhead, and containing a supply of water for urinal, closet seat-bowl, and washing. The ventilating arrangements are ample. Besides the usual end and deck-light sashes, there are nine globe ventilators on each side.

The outside of the car is painted a dark olive color, with but little striping or other relief decorations, and presents a plain but rich and tasteful appearance. The car has six-wheel trucks with 42-inch Allen paper wheels, also Miller platforms and automatic air-brakes.

The ordinary coaches, of which there were two in the train, are painted in the same style on the outside as the drawing-room car, and have four-wheel trucks, the wheels being 42-inch paper. Their length is 55 feet outside of sills, and each of them seats 68 passengers. There are 18 windows (glass 28×16) on a side. Each window has four stops, so the sashes can be raised more or less to suit the convenience of passengers. Buntin seat-ends with nickel-plated arm-rests are used, and under each seat is one of Creamer's sliding foot-rests placed next to the car side. The seats and front of backs are upholstered in crimson plush, with green plush on the other side. The inside is finished with ash, walnut, mahogany and maple, with gilt moldings, which harmonize well with a light colored head-lining. The saloon and Baker heater are both at the same end of the car. The heating pipes are looped under each seat so as to be where they are most needed, in near proximity to passengers' feet. Each car has four two-light center lamps. There are in the roof eight globe ventilators on a side, and in addition to these, there are ventilators over each of the end windows, that can be opened or closed at pleasure. The trucks have four check-chains, the inner ones being fastened both to the sills and a cross timber, and the outer ones to the draw-timbers, so that in case the car gets off the track the chains are likely to be of some service, and will not break their fastenings at the first "yank". There is also a smoking car in the same train, fitted up with Wakefield rattan seats, made concave instead of convex, so as to fit the human anatomy and prevent it from sliding off its resting place in a transient fit of drowsiness.

These cars were built under the supervision of Mr. F. D. Adams, the General Master Car-Builder of the road, and a well-known veteran in his voca

tion. That their mechanical construction is as good as skill and experience can make it, does not, of course, admit of any question. As we have intimated, the only points which tempt criticism are subordinate ones, in regard to which individual tastes necessarily differ, and one of these we have omitted to mention. It is the sharp edges and corners of the wood-work of the revolving chairs in the drawing-room car. Would not a little rounding off make them look quite as well, and perhaps *feel* a little better in case of a violent train collision?

The Late Enos Varney.

On another page we give an excellent likeness of the late Enos Varney, the well-known master car-builder of the Fitchburg Railroad, who was killed in the accident which occurred at Littleton on the 7th of October. A brief obituary notice was published in a previous issue of the CAR-BUILDER, but we have since obtained some additional particulars of his life which will be perused with interest by many of our readers.

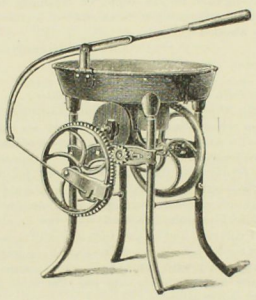
Mr. Varney was born at Rochester, Strafford County, N. H., in 1813, and was the eldest of eleven children. His parents being in humble circumstances, his opportunities for obtaining a school education were necessarily limited. In his boyhood he worked with his father in a brickyard, but, on reaching the age of twenty-one, went to Dover, N. H., and apprenticed himself to the house-carpenter business. He then went to Charlestown, Mass., and worked at his trade until 1843, when he formed a partnership with a Mr. Clark (the firm being known as Clark & Varney), and carried on business as builder and contractor for three years. He then visited California, where he remained a year or two, and on his return, in 1846, entered the employ of Mr. J. A. Kimball, contractor, and afterward master car-builder of the Fitchburg Railroad, he having previously built the roof of the first round-house erected by the company. In 1853 he was himself appointed master car-builder of the road, and held the position until his death, embracing a period of 27 years. Of his integrity, capacity, close application and correct habits in the discharge of his duties, his long and acceptable service in the responsible position which he filled is a sufficient testimonial. He was a valued member of the Master Car-Builders' Association, having been connected with it since its organization, and rarely if ever absent at any of the annual meetings. He was also a frequent attendant at the monthly meetings in New York. He was held in high esteem in the city of Charlestown, and was at one time a member of the city council. In his early life he took much interest in military and fire companies, and a short time before his death participated in a firemen's parade as a pleasant renewal of old associations. All who enjoyed the pleasure of his acquaintance will testify to his affable and unobtrusive manners, his kindliness of heart, and his uniform urbanity and courtesy in personal intercourse. He leaves a widow and four daughters.

A New Freight Train Brake.

Mr. William Loughridge, of Baltimore, who has been engaged for many years in investigating the railway train brake problem, has made arrangements with the Baltimore & Ohio Railroad Co. for testing a new method of applying brakes to freight trains. This system is the invention of Mr. Loughridge, and is to be operated by the engineer, the power used being steam from the locomotive, aided by the momentum of the train. This is done without any flexible hose connections, or the use of air or air pumps in any form. The engineer can apply the full braking power to a train of any length in two seconds, and can also relieve the brakes from the wheels within the same time, as well as graduate the pressure to any degree required for grades or stops. The power is under such perfect control, and can be so nicely adjusted, that it is impossible to slide the wheels of any car in the train, whether loaded, partly loaded or empty. The experimental train is now being equipped at the Mount Clare shops, and will be ready for the test by the middle of February. This is just the kind of brake all the railroads are waiting for, and we hope the inventor will inform the committee of the Car Builders' Association on freight train brakes of the results of the forthcoming test, as well as full particulars in regard to the construction and cost of applying the brake.

Portable Forges.

The great advantages of portable forges have led to their utilization in many different lines of business. They are especially adapted to the uses of iron workers, plumbers and railroad repairers, whose work requires some way of heating iron quickly and easily. The cut represents a No. 9 portable forge, made by the Empire Portable Forge Company, of Cohoes, N. Y. The peculiar feature of this forge is that it is operated *without belts* or bellows, and as there is no leather or wood



No. 9. Empire Forge.

used in its construction, it is practically indestructible and unaffected by exposure to the weather. This *can not be said of any other forge*, and as a consequence many railroads are purchasing them in preference to cheaper forges which have belts to operate the blowers. The above-named company reports considerable activity in the demand for its forges abroad. It has been engaged in their manufacture for several years, and has sent them all over the world, and in every case, as far as known, they have given perfect satisfaction. The company has just put on the market the "Western Forge," which is a new one, with angle-iron legs, in which belts are used to run the fan. It does this to meet competition, and has priced them very low. Correspondence is invited from all who have need of implements of this character. Prices and circulars will be sent to applicants.

Heating Cars by Friction.

Prof. Webster Wells, late of the Massachusetts Institute of Technology, has invented a new and rather remarkable apparatus for heating cars. The *Economist* says of it:

The principle of this machine is friction, and the simplicity of construction and adaptability to every place where there is waste power that can be utilized, are as wonderful as are the results accomplished. No one can see it in operation without feeling that this is one of the very few great inventions of the age, and that it places Professor Wells in the very front rank of inventors. It consists only of an iron cylinder two feet long and one foot in diameter, having a fixed plate of hardened iron in one end, and a second plate attached to a revolving shaft which presses lightly or closely upon the plate, as circumstances require. The cylinder is filled with water, the shaft revolves, and from the friction of the plates, the water in an incredibly short time, is heated, and by means of steam pipes, can be carried to great distances for heating purposes.

The construction of the machine is such that it is easily adapted to every place where there is waste power, as in mills, factories, public buildings and cars. In fact, in every place where any power is used, the machine can be applied, since the power required for its operation is so slight as to be of almost no account. Thus, to carry a machine with 36 square inches of friction plates, the ordinary size, $\frac{1}{2}$-horse-power only is required, while a machine with 225 square inches of friction surface will require at most but four horse-power, and will heat a room 60×200, or 126,000 cubic feet. In steam cars the machine is easily and cheaply adjusted to the axles, the power being taken directly from the wheels, so that in case of accident, such as started the train of thought which resulted in this invention, all danger from fire is entirely eliminated.

The machine has already been in practical operation for some months, and has demonstrated that with 36 inches of friction surface, a room of 10,000 cubic feet can be heated more uniformly and quicker than by the use or coal, wood, or steam, and absolutely without expense save the wear of the friction plates and the pittance for extra coal under the boiler. Indeed, for simplicity of construction, for adaptability to every place where waste power may be utilized, and for the results attained, the machine is a marvel. It has been visited by hundreds of well-known engineers, mechanics, railway and mill superintendents, and all unhesitatingly pronounce it a great and valuable invention. Mr. N. W. Churchill, a well-known business man, and an intimate friend of Prof. Wells, is manager of the company organized for the introduction of this heater, and at present has his headquarters at 178 Devonshire street, Boston, where anyone who desires to see in practical operation a machine which will produce heat without fuel or fire, will find pleasant employment for a half hour of leisure.

TENNYSON can take a worthless sheet of paper and by writing a poem on it make it worth $5,000. That's genius. Mr. Vanderbilt can write fewer words on a similar sheet and make it worth $50,000,000. That's capital. And the United States government can take an ounce and a quarter of gold and stamp upon it an "Eagle-bird" and "twenty dollars." That's money. The mechanic can take the material worth $50 and make it into a watch worth $100. That's skill. The merchant can take an article worth 25 cents and sell it to you for $100. That's business. A lady can purchase a comfortable bonnet for $10, but prefers to pay $100 for one, because it is more stylish. That's foolishness. The ditch-digger works ten hours a day and shovels out three or four tons of earth for $1. That's labor.

A LADY inquired of the spirit-rappers how many children she had. "Four," rapped the spirit. The husband, startled at the correctness of the reply, stepped up and inquired, "And how many children have *I*?" "*Two*," answered the rapping medium. The husband and wife looked at each other for a moment with an odd smile on their faces, and then retired non-believers. There had been a mistake made somewhere.

Communications.

Four and Six Wheel Trucks.

To the Editor of the National Car-Builder:

Referring to your article on four and six-wheeled trucks in the CAR-BUILDER for October, and particularly to the latter part, wherein allusion is made to the experience of a western road as to the greater power required to haul cars with six-wheeled trucks, I would say, that—weights above rails being equal—it is difficult to discover any reason why cars on six-wheeled trucks, with a 11-foot wheel base, cannot be drawn as easily as cars on four-wheeled trucks with a 7-foot wheel base, other than such as is due to the greater length of the wheel base of the six-wheeled truck, and consequently increased friction of the wheel flanges against the rails when the car is traversing curves. Such increased friction is caused by the want of sufficient end play of the journals in the journal boxes, particularly those of the middle wheels, and is a difficulty easily remedied.

The easier riding of cars on six-wheeled trucks is probably due to the greater length of the wheel base of such trucks. As the length of wheel base increases, the motion imparted to the body of the car diminishes, both by reason of the greater steadiness of the truck in passing around curves, and the reduced motion at its centre in passing over vertical inequalities in the track.

The improvement in the riding of cars on four-wheeled trucks with a 7-foot wheel base, over cars on four-wheeled trucks with a 6-foot wheel base—lengths of bodies being equal—is very perceptible, and it is not unreasonable to suppose that the further lengthening of the wheel base of 4-wheeled trucks, even to eleven feet, would result in correspondingly improving the easy and steady riding of the cars.

The steamboat train of the Old Colony Railroad, is made up of cars 55 feet in length of body, with seats for 70 passengers and mounted on 4-wheeled trucks with 7-foot wheel base, 33-inch wheels, and axles and journals of the M. C. B. standard. The overhang of body at each end is 6 feet, leaving the distance between the centres of the points of bearing upon the trucks, 43 feet. Owing to this relatively short overhang, and long space between the points of bearing upon the trucks, these cars run with a steadiness impossible to attain in cars with shorter bodies on trucks with the same length of wheel base.

The new cars, running since December 1 on the Boston & Albany four o'clock afternoon train between Boston and New York, are of the same size as those of the Old Colony above mentioned, except that the wheels are 42 inches diameter, and the overhang of body slightly greater.

The drawing-room cars attached to the same train are 60 feet in length of body, mounted on six-wheeled trucks, with 42-inch wheels, and wheel-base of 11 feet, the overhang of body at each end being 8 feet, and the distance between truck centres 44 feet.

Assuming, then, that a car on properly constructed six-wheeled trucks with 11-foot wheel base can be drawn as easily as a car on four-wheeled trucks with 7-foot wheel base—weights above rails being equal—and that the easier riding and steadier motion of the car on the six-wheeled trucks are owing to the longer wheel base; and further assuming that by considerably increasing the size of axles, journals and journal-bearings, a car with body 60 feet long on four-wheeled trucks may be run long distances without danger of heating the bearings, the question would seem to be as to the practicability of constructing a four-wheeled truck on a 11-foot wheel base, with a frame of sufficient strength to support the weight to be carried upon the truck centre, and with bearings equalized upon the journal-boxes by some method other than the use of equalizing bars applied in the ordinary way.

The frame of the six-wheeled truck being supported at the centre by the journals of the middle wheels, may be made lighter, while the short space between the journal boxes of the middle and end wheels permits the advantageous use of equalizing bars, and the increased number of journals diminishes the danger of heating the bearings when the car is running long distances.

For use, therefore, under the longer and heavier cars running long distances, the advantages seem to be with the six-wheeled trucks, notwithstanding the additional weight of the middle axle, wheels, pedestals and journal boxes, with extra bolster and spring plank

It may be, however, that a car with body 60 feet in length, mounted on four-wheeled trucks with 7-foot wheel base, 42 inch wheels, axles 6 inches in their largest diameter, journals 5 by 8 inches, overhang of body 6½ feet and distance between bearings upon truck centres 47 feet, would gain in ease of riding and steadiness of motion, over cars with bodies 55 feet in length, correspondingly with the increased length of body and distance between bearings upon the truck centres, and that by increasing the wheel base to 8 feet, which would not be too long to permit the use of equalizing bars, results might be attained, very nearly approximating to those attained by the use of six wheeled trucks.

CHARLES BARRETT.

Boston, Dec. 1880.

To the Editor of the National Car-Builder:

In the October number of the CAR-BUILDER I read an article dealing with four and six wheel trucks for passenger coaches, the purport of which was evidently to show the favorable comparison of the former with the latter. The same question has frequently presented itself to my mind as worthy of consideration; and, as a matter of principle, I am quite in accord with the opinions there expressed, and believe that it is only a question of time when six-wheel trucks will be superseded by others with four wheels, as a matter of economy and simplicity, and also, the more important one of safety.

Taking the latter consideration first, if the six-wheeler is a necessity for the sake of safety, then all passenger trucks ought to be so constructed. But I have yet to learn that a six-wheel truck is any safer than one with four wheels.

So far as my observations have been taken from practical experience, I am inclined to think that the four-wheeler is the safer, for the following reasons: First, the construction of the truck is much less complicated; second, the framing being shorter, it is more compact, and consequently stronger, and more fit to stand the wear and tear of hard service; and third, it is more readily inspected at short stopping stations, and, in the event of any flaw or defect existing in any part, its discovery will be more certain under ordinary inspection.

Then as to first cost. A four-wheel truck is only about two-thirds the cost of one with six wheels, and the same ratio will hold good for its maintenance, independent of the economy to be gained from dispensing with the haulage of a large amount of unnecessary weight, in combination with the extra friction involved by the flanges of the wheels at every curve around which they run.

There is also another element of safety that a car with eight wheels has over one having twelve wheels as ordinarily constructed, and that is in the application of brake power. For instance, in an eight-wheel coach, brake shoes are applied to all the wheels, whereas, with a twelve-wheel coach, there are seldom more than eight wheels utilized for stopping purposes, and as the stopping of a train in the shortest time and distance possible, depends on the proper application of brakes to all the wheels, it is evident that where brakes are applied to only part of the wheels, both the time and distance will be greater in stopping, in proportion as the weight of the train exceeds the frictional resistance of the brakes. To explain this point more clearly, suppose the case of a train of cars, each having eight wheels, with brakes applied to all the wheels, and take a similar train where the cars have twelve wheels, but with brakes applied only to eight. By experimental test it will be found that the former will stop in about two-thirds the time and distance of the latter, and assuming both trains to be running at the rate of 40 miles an hour, or 58 feet per second, when the brakes are first applied, the time consumed by the former in stopping will probably not exceed 16 seconds, and the distance run will be about 464 feet, while the latter will probably not be less than 24 seconds, and the distance run 696 feet, a difference of 232 feet in favor of the eight-wheel cars.

With such an advantage of time and distance, it is not difficult to conceive what impending danger might be averted in the event of seeing another train ahead stopping the way; or, what would be still worse, a train approaching on the same track.

Then, with respect to the carrying capacity of axles, if we take any ordinary passenger car, weighing a total of 50,000 pounds, the weight to be borne by the four axles will not exceed 44,000 pounds, or say, for each journal, 5,500 pounds, or 2¾ tons. Every-day experience has proved that the Master Car-Builders' Standard Axle is capable of carrying safely a much greater weight than this, and there is still left a very considerable margin of safety before any deflection, due to the weight upon the journals, would be observed.

In adopting four-wheel trucks for heavy "palace," or "sleeping" cars, weighing from 70,000 to 80,000 pounds, it would be necessary to increase the diameter of the axles, not so much on account of gaining strength, as for an increase of bearing surface to the journals. It is well known that the strength of solid cylinders is as the cubes of their diameters, therefore assuming that the M. C. B. axle journal, of 3¾ inches, is sufficiently large for a car of 50,000 pounds, to find the proportionate size of journal for a car of 80,000 pounds, we work out the equation as $50{,}000 : 80{,}000 :: 3{\cdot}75^3 : 4{\cdot}38^3$, which shows that a journal, 4⅜ inches diameter, would be equally strong for the heavier car. The vertical pressure need not exceed 250 pounds per square inch of surface of bearing.

With bearings of good material, well fitted to the journals, and good lubrication, there should be no trouble experienced by running under such a pressure; and by the adoption of four-wheeled trucks in place of six, I believe that the running gearing of coaches could be greatly benefited, with due regard both to safety and economy.

JOHN ORTTON.

ST. THOMAS, Ont., December, 1880.

Passenger Car Decoration.

To the Editor of the National Car-Builder:

When the great activity in railway development which followed the war was fairly under way, a new impetus was given to car decoration. There was a demand on the part of the traveling public for something richer, more artistic, and costly than what had previously been attempted, and car-builders have since then been doing their utmost to improve the style and quality of the inside finish, nor have they by any means neglected the outside. Up to the time referred to, the inside treatment of cars displayed little more than good carpenter and joiner work, with such embellishment as could be superadded by the painter. Cabinet work proper had not been called into requisition, and

rare woods were but little used. But since then the improvement in this direction has been so great that it may almost be said that the limit has been reached. So far as material, in the way of fine cabinet and other woods is concerned, nothing further is attainable. The use of veneers, which was so common a few years ago, is becoming nearly obsolete, and the same may be said of most other devices for producing mere surface effect. People want in decorative work the real thing, and not a skillfully contrived imitation; and so drawing-room and sleeping coaches, as well as ordinary day cars of recent construction, have an inside finish of solid woods, whether of ash, walnut, oak, maple, cherry, and other native varieties, or of the more rare and costly kinds imported from distant regions of the world.

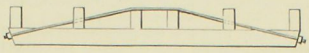
But with all this wealth of material there is a certain lack in the desired effect, which may be due to a satiety of riches, or to an absence of artistic skill in dealing with the material. Panels, over and between the windows, look well enough when faced with French walnut burl or Hungarian ash, but after a time the confused twisting of the fibers illustrating nature's handiwork, becomes a little wearisome, and the varying tints a little monotonous. Now, as there must be variety in car ornamentation as well as in the styles of house furniture, and as one fashion, no matter how good it may be in itself, must give place to another, we would ask, Why not introduce carving a little more into car work? This kind of ornament might be very effectively introduced in many ways. It is specially adapted to panels, small or large, and these are necessarily somewhat numerous in car work. A neat bit of flat carving, or carving not projected, but sunk to a line with the face of the panel, whether the panel is of chestnut, oak or other native wood, is an excellent relief to a blank space. It need not be very elaborate, or much more costly than the elegant surface finish to be found on some of the best cars, but still it may be said that the more elaborate it is, the better is the effect. It is a species of ornament that should be used as if it were of some value, and not spread everywhere, Chinese work-box fashion. Some of the prominent end panels, one or two on the saloon, and a few of the window panels, would be sufficient, as a rule. Whatever is done, however, the carvings should not all be alike, so as to become a wearisome repetition, suggesting the idea of machine work pure and simple, such as we had some ten years ago, and which was so bad that people would not have it longer. The machine work killed hand-carving, and the latter went out of date for the time being.

The wood-carving of the future, while it will be cheaper than the old hand-work, will not have the lifeless monotony of machine work. A revolving machine cutter can be used for the routing and deep digging just as well as a hand gouge. The fret-saw can cut the outline just as easily as a chisel can. Indeed, this method is used in a great deal of the best carving that is done at the present day. The man guides the tool and steam does the labor, in a way somewhat analogous to the inferior workman who chips away the superfluous material from the rough block that is to be wrought into a fine statue. The carving in such case is essentially hand-work, and if cut into a flat surface will not look as if it was struck by an inverted mould.

One advantage of flat or sunken carving is that it does not incommode people who come in contact with it or rest against it, as is the case with the little projecting rosettes that are sometimes found on seat-backs and elsewhere; and as a notable instance, in the center of the seat-backs of the Pennsylvania Railroad waiting room at Jersey City—an ingenious way of keeping people who occupy the seats from falling asleep and missing their trains. A great many people are getting tired of the so-called Eastlake and Queen Anne styles of furniture, with their sharp corners and cutting edges, the very sight of which suggests the idea of discomfort; when a little rounding off would render them much more popular and enduring. SIDNEY.

Trussing a Freight Car Body-Bolster.

A difference of opinion having arisen among certain parties connected with a prominent car-building establishment as to which of the two methods illustrated in the diagrams is the best for trussing a freight car body-bolster, we herewith present the



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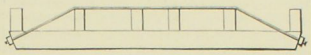

No. 2.

problem to our readers, and shall be glad to print in our next issue any reasons for preferring either method that may be sent to us. We number the diagrams 1 and 2 for convenient reference.

Master Car-Builders' December Meeting.

After the reading of Mr. White's paper, an abstract of which will be found in another column, a prolonged discussion took place, in which a number of gentlemen participated.

Mr. Weaver, of New York, preferred oil and lead without turpentine. If turpentine is used, the priming sinks into the wood and leaves a dead surface. He uses a coat of priming and two coats of lead, and has abandoned the use of "rough-stuff." On this he puts three coats of body color. He is engaged in painting street cars, and in that kind of work durability is of more importance than a high finish. When a vehicle strikes a car which has been primed with turpentine, the paint comes off, sometimes like an egg-shell, but on those cars primed with oil it stands much better. He had used both English and American varnish, and has found that the latter stands equally as well as the former. He had painted nearly all the mail wagons running in New York. He found great trouble with vermilion; has used Japan with it, but this increases the tendency to flake off, and the color would often change and dark blotches would come out on the surface. He then used gold size, and also mixed the vermilion with oil and turpentine, but the last wagon painted with oil began to turn before it left the shop. He thought there must be some impurities in the oil, and would like to know how these can be detected. He had also found trouble with ultramarine blue in getting it to stand.

Mr. Wills said vermilion with pure linseed oil would hold its color the best. The difficulty with ultramarine blue is that we do not get any that is pure.

Mr. Brock favored the sponging of wood before painting, but thought that sandpapering afterward was worse than useless, as there is a tendency to flake off when paint is applied to a perfectly smooth surface. He would rather have woodwork finished without sandpapering.

Mr. Wills said he could not understand why paints will not hold on smooth surfaces. If a piece of tin is rubbed over very sparingly with paint it can be twisted as much as you like after the paint is dry, and it will stay, but if turpentine is used, then all the paint will come off.

Mr. Brock said that was because when the paint is new it is elastic. After it has been on a few years it loses its elasticity and will not stretch.

Mr. Munroe asked whether the wood was allowed to dry thoroughly after being sponged?

Several members answered yes, and Mr. Brock said that the object in applying the water is to take off the hard finish which the carpenters put on with sandpaper.

Mr. Smith inquired which was the most durable, light or dark colors, on cars?

Mr. Brock thought dark colors were the best, because cars could be painted in such tints more quickly and be restored easier after they grew dingy than they could be if painted light. The endurance, though, depended more upon how the painting was done than on the color or tint.

Mr. Campbell asked whether a car could be painted more cheaply of a dark color than of a light color. Some dark colors were very expensive, whereas there are light colors, like straw color, which are cheap. He thought light colors would stand the best.

Mr. Brock said the difference between a dark and a light color for a car is that after being in service for some time the former will be of much more uniform tint than the latter.

Mr. Wilhelm said he had always found light colors the best. The sun is death to varnish on a dark color.

Mr. Park for nearly 25 years had painted cars as follows: He primed all new work with raw oil, adding thereto a small quantity of English patent dryer, and after that coating was thoroughly dry he puttied up the holes, and when that was well set he gave the car another coat of light color, adding a slight quantity of turpentine, and after that was thoroughly dry he was obliged to face his work down, which he did by giving two coats of rough-stuff and one light coat. Then he faced his car down with pumice stone and water, and after it was done dusted it off and applied his first coat of paint. From the facing down of the car until it was finished he used no sandpaper. He gave three coats of very thin body color, giving about 12 to 24 hours between coats. He added a little varnish so as to give it a slight gloss. Then he rubbed it down with fine pumice stone, striped it and gave it an additional coat of rubbing varnish, rubbed slightly again and finished with one coat of wearing body varnish. Cars thus finished ran on an average from 12 to 14 months without a coat of paint. If you do not get the foundation right you will have a bad job. In mixing his color he uses one part turpentine, two parts japan, and one part varnish, and he found that it worked well and did not crack. The color on cars running east and west continuously perishes more on the south side.

Mr. Page said the trouble with linseed oil was that moisture gets into it, and we do not keep it long enough to allow this to evaporate. If the gentleman who complained of the difficulty of getting good oil would insist on having an old oil, he would not have the trouble of which he complained.

Mr. Adams said much of the difficulty in painting consists in the time allowed. On a line he knew of, only fifteen days were allowed for painting a passenger car. On the road with which he was connected they could not paint a passenger car thoroughly in much less than two months. Some of their cars had run nine years without repainting. He preferred a light to a dark color, because the former reflects and the latter absorbs the rays of the sun. When a car is running along a sea or lake shore, the paint on the side next to the water perishes first. On the Lake Shore road this is the north side, whereas on the New York & Boston Shore line it is the south side.

Mr. Barbour said that seven or eight years ago his road had two drawing-room cars, which were used for summer travel. In the fall they were cleaned and varnished, and run into the car-house alongside of the station wall, which was very damp. The following spring it was found that on the side and the end of the car next to the wall the varnish was almost entirely destroyed, and stood out in little shreds. On the cars which run on the New York & Boston Express Line, the paint on one side and end perishes much faster than the other side, and on cars running through to Albany, the south side and west end always perish sooner than the others.

AN Ohio paper proposes to number the hours of a day and night consecutively from 1 to 24, or from midnight to midnight, thus doing away with a. m., and p. m. in railway time-tables, and elsewhere. This is a good idea, and will have to be carried into effect sooner or later. Like the metric system, and that of phonetic writing, the difficulty is in switching off the present plan long enough to switch on the new one. The advocate of the proposed new method aptly says, that there is no more reason for having two 12 o'clocks in one day than then there is for two 12-mile posts on a 24-mile railroad.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and copies kept for sale, at the following places:*

A. WILLIAMS & CO., 283 *Washington Street, Boston, Mass.*

L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*

WILLIE H. GRAY, 306 *Olive Street, St. Louis, Mo.*

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MR. L. E. WATERMAN, who has been with the *Railroad Gazette* several years, has connected himself with the NATIONAL CAR-BUILDER, and will act as Corresponding Editor. He is fully authorized to represent this journal in all matters of business.

WE cordially extend to our readers the customary greetings upon the advent of a New Year, and in doing so we desire to acknowledge the liberal encouragement and support we have received during the year that has just closed. Since the issue of our last January number, our subscription list has increased beyond our most sanguine expectations, and the same may be said as to our advertising patronage. It is hardly necessary for us to say that we shall strive to make the CAR-BUILDER in future even more acceptable to its readers than it has been in the past. Its pages will be a record of whatever is valuable and progressive in railway rolling stock construction and management, and will also contain a careful summary of current railway news, notices of new inventions, items of local and personal interest, correspondence, illustrations, etc. With our increased facilities, we shall make our journal second to none of its class as a vehicle of railway intelligence, a first-class medium for advertisers, and in every respect worthy of the flattering support it is now receiving.

ENGLISH AND AMERICAN RAILWAY CARS.

It is the general impression in this country that our railway rolling stock of all kinds, and especially passenger cars, is much better adapted to the various branches of service for which it is designed, than is the rolling stock of English roads. Between the two there are many essential points of difference, and it is perhaps too readily assumed by people who are accustomed to our own methods, that the English way of doing things is the result of prejudice or ignorance, and that it will eventually give place to the more progressive American practice. This view of the matter is warranted to some extent by the partial introduction of Pullman cars upon some of the English roads, and some minor improvements in the prevailing type of passenger coaches in use there, which seem to have been suggested from our side of the water. But there is really a very slight prospect that our style of cars will be adopted to any extent by English roads. The conditions of railway traffic in the two countries are not the same, and this suggests that there may be a reason for the methods peculiar to each, a reason not necessarily based upon prejudice or a blind adherence to established custom. Our critical travelers find no fault with the permanent way, station houses, and other structures upon English roads; but the equipment, as we call it, they are very confident could be improved. We feel quite sure that if a mixed train composed of English carriages and our own ordinary day passenger cars, should be run as an experiment upon any one of our leading lines, the preference would be given, and that most decidedly, to our own cars. And this, from our own point of view, would settle the matter. But it is more than likely that the same experiment tried upon an English road would show a directly contrary result.

We have said that there are reasons for the peculiarities of English practice, and some of these are given in a recent number of *The Engineer*, in reply to an American critic. The writer, in reply to the claim that four and six-wheel trucks make cars ride easier, says that this is refuted by the running of Pullman palace cars and English first-class carriages in the same trains on the Midland road. A train of English coaches, the writer says, must be regarded as a whole, the compression of the buffer springs between the coaches making the train one long, flexible vehicle; and as for six-wheel trucks, they so increase the cost of haulage by their additional weight as to materially reduce the earnings. He states, however, that on all the English main lines, long coaches with four-wheel bogies have been introduced, and that these are much lighter and better than American cars of the same capacity, but how this result is attained the writer does not say. The side doors are of course retained, and there are no passage ways through the center, the reason being that the English people prefer to have it so. It is further said that some years ago several American cars were ordered from the United States for trial on the Midland road. At first they were attractive from their novelty, but were deserted after a time, and had to be taken off the line. The locomotive cab, considered so indispensable in this country, is now to be found on all English railways, although they are by no means universally liked, the drivers as a rule preferring only the weather-board and hood. With respect to freight traffic, the English road managers do not favor heavy engines and correspondingly heavy trains. All the goods and mineral traffic is moved at a speed of from 25 to 30 miles an hour in order to keep out of the way of passenger trains without shunting, and necessitates of course shorter and lighter trains.

The Engineer concludes the article referred to by saying, that "no greater mistake can be made than to compare the results of prejudice with those of conditions which are peculiar to an individual or nation, and which must be fully understood and carefully weighed before we have a right to condemn actions which are wholly controlled and regulated by them," and rather pointedly suggests that it is just possible that people in England know better what they like, and what is best for them, than any stranger can, even though he come from the United States.

THE ANTI-RAILWAY CRUSADE.

Judge Black's sweeping declaration that railroads are not the property of the companies that operate them, but public highways, like turnpikes, canals, and navigable rivers, has received a pretty thorough sifting. It turns out to be nothing more than the opinion of a paid attorney, whose business it is to sell advice to his clients, and is of just as much consequence as the opposite opinion of a lawyer retained on the other side. These conflicting arguments settle nothing, but they stimulate people to think for themselves; a sound public opinion is thus formed, which is more effective in maintaining right relations between railroads and the state than are one-sided professional opinions and precipitate legislation. Railroads are the pride and boast of our people. Without them we should relapse into a condition akin to barbarism. The benefits they confer, as compared with the burdens they impose, are as a thousand to one, yet there is a growing army of enthusiasts who think their power should be curtailed, or the government, both state and federal, will soon be a mere puppet in their hands. This is all bosh, however frightful it may sound when uttered from a communistic platform, or proclaimed by the self-seekers who want to live and grow fat at the expense of the corporations. These corporations are the creatures of law, and all our laws are subject to constant revision by the people. If the people shall ever be bought up by the railroads so the source of law shall be corrupted, it will be the fault of the people and not of the roads. Combination has so far proved no match for competition, and consolidation is far more beneficial than hurtful to the business interests of the country. Every step in railway progress, both at home and abroad, has shown that these corporations cannot afford to be unpopular. They can stand no hostile hue and cry caused by high and oppressive rates and unjust discriminations. The constant tendency has been toward lower rates and fares; and the real cause of the complaints which elicited Judge Black's letter, if probed to the bottom, would turn out to be the desire of certain parties in heavy lines of trade for special favors and discriminations inuring to the benefit of themselves or to their particular localities.

IS THERE ANY CAUSE FOR CROAKING?

The increasing burden of traffic upon the great east and west lines and the urgent demand for more cars and engines to meet the requirements of transportation are indications of railway prosperity, present as well as prospective, that are highly gratifying. In view of past experience, when a period of extraordinary railway development and activity was suddenly followed by a corresponding period of ruinous prostration, there is here and there a croaker to be found who predicts that the old folly is about to repeat itself, and that another breakdown is inevitable, its recurrence being only a question of time. Everything, they say, is now booming, and anything like a boom in business is suspicious and should inspire caution—the great iron boom of last year, for example. We do not think these fears are justified by the facts, nor do we regard a few failures in the coffee trade as a prelude to a wide-spread financial revulsion. The busi-

ness of railroads is becoming more and more the gauge and index of industrial growth and productiveness. The products of the country, agricultural, mining, and manufacturing, are steadily and enormously increasing every year, as is shown by transportation statistics and the census. Most of the old bankrupt roads, built on a basis of speculation, have been re-organized on a better and safer basis, or absorbed into some of the consolidated systems in vogue. This process has had the effect of placing a great number of poor, starveling roads under better and more capable management, and securing for them more advantageous connections. The result is that the existing roads, especially those east of the Mississippi River, are doing a prosperous and legitimate business in handling the immense through and local freight tonnage. Earnings are not sacrificed in ruinous cut-throat competition. The system of pooling works satisfactorily both to the roads and their patrons. The outlays for new construction are restricted mainly to such extensions and improvements of existing lines as are necessary to meet the requirements of traffic. Furthermore, there is no excess of foreign capital seeking investment in new and visionary projects. It is safe then to say that our railway lines stand now upon a basis of prosperity which cannot lead to disaster so long as the stability of such basis is not impaired by reckless management or a sudden falling off in the productive resources of the country—the latter contingency not being among the probabilities of the near future.

FAST TRAINS.

This is a fast age. We think fast and live fast, and this naturally begets an insatiable desire to travel fast. Railroad managers are expected to provide the means for gratifying this desire, with safety to passengers and without detriment to earnings, if possible, but at all events to put the trains through according to the latest and fastest schedule. For a number of years the regular time between New York and Chicago has been 36 hours, or a speed of 25 miles an hour, including stops. This is not what might be called slow, but the impatient public is more than ever impressed with the idea that time is money, and that something better than this should be accomplished on all the great lines in view of the improvement in rails, road-bed and rolling stock. Managers, in order to meet this demand, are put to a terrible strain. They must provide the ways and means, head off competition, take the responsibility and risk of accidents, and what is more important than all, they must make the traffic pay. This last requisite, in the face of rival and fluctuating rates, the dead weight of sleeping and drawing-room cars, and the wear of track and superstructure from the increased weight and speed of trains, is not an easy thing to respond to. If rates could be classified according to speed and operating expenses, and at the same time be made equitable and uniform on this basis, and be maintained with something like regularity, it would not only make fast running less precarious in the matter of net earnings, but the justice and expediency of an extra charge for shorter time would be generally admitted.

A few years ago, when the increasing weight of trains was regarded by managers, master mechanics and car-builders as a growing evil that must be speedily checked to prevent expenses from swallowing up earnings, it was believed by many that the heavy palatial cars were only profitable as they served to advertise a route, and if their maximum length for through passengers could be reduced to 50, or even 40 feet, they would, on mechanical principles alone, be much safer and more economical. These notions, however, have now become obsolete, or nearly so, and 60, and even 70-foot coaches, have become an indispensable feature of fast through trains. The more luxurious and costly the car is, the greater presumably is the proportion of dead-weight to each passenger, and the higher must be the speed as compared with that of ordinary trains. This is practically the way things are now, with not the slightest prospect of any retrogression. The people like to have it so, and the railroads have no alternative but to please their patrons.

It would be interesting, however, to know just what the inside views of the more prudent class of railroad managers really are in reference to the safety and expediency of fast trains, whose schedule time ranges from 40 to 45 miles an hour. It is safe to say that no prudent manager or experienced railroad mechanic approves of such running. It is extremely hazardous, especially in severe winter weather, and involves an amount of anxiety on the part of railroad officials, engineers and train hands, that is a severe tax upon mind and body; and we can readily credit the statement of an exchange, that nine out of ten of the general managers of our roads would to-day favor a legal limit of train speed to 30 miles an hour, with a heavy penalty for its violation. It is one thing for unthinking people to be sped through the country with break-neck velocity while they are asleep in their berths, and quite another thing to have life and reputation staked upon the safety of the performance.

THE present demand for freight cars is greatly in excess of the supply, and is likely to be so for some months to come. In view of the increasing tonnage and road mileage, and the inability of the road and contract shops to meet the existing demand, apprehensions are felt in some quarters that the situation next year will be more embarrassing than it is now. We do not think there is any cause for alarm. However great may be the traffic, it is not likely we are to have a permanent car famine. With our capabilities in the way of skill, capital, machinery, and material of all kinds, it would be a wonder indeed if the managers of all the prosperous dividend-earning roads in the country should have to stand in line at the offices of the car manufactures to get their orders entered for six months' delivery. When it comes to this, it will be found that there is a margin of development in the car-building industry sufficient for the crisis, and enterprise enough among capitalists to see it and act accordingly. Whatever number of cars per mile the roads actually need to handle the traffic of the country, and are able and ready to pay for, will certainly be forthcoming upon due notice. To suppose otherwise, would be a reflection upon the shrewdness, sagacity and energy of the business community.

THE December number of that excellent publication, *The Coach Painter*, contains a full page illustration of the Eastlake style of outside passenger car ornamentation. The next number will contain head-lining illustrations of the same style.

WE have received the Annual Report of the Proceedings of the Master Car-Painters' Association. It is a well-printed little pamphlet of 83 pages, and contains a detailed report of the discussions and papers read at the meeting of the association in St. Louis in September last.

CHICAGO, since the census returns were published, is a little ahead. St. Louis owns up on the score of population, but has got a string to its bow worth two of that. A mammoth machine is being constructed that will take the kinks out of the Mississippi river in ten days, so the water will run in a bee-line for the Gulf and get deeper every year. With tide water and heavy draught ships coming up to the bridge, where will Chicago be? Obviously nowhere. The prairie wolves will howl in her streets, and screech owls roost in her railway depots and elevators.

Barr's Hand-Book for Steam Engineers.—This is an excellent little manual for those who own or manage steam machinery, but whose practical knowledge of the subject is limited. It contains in small compass a great many valuable suggestions that are worthy of attention by owners, purchasers, operators and even manufacturers of steam engines; and if carefully studied will repay for the trouble a hundred fold in economic saving in many ways. It is, in fact, just the book for the large class of people, farmers, manufacturers and others, who have need of engines but do not know exactly how to use them. There are no bewildering details or technicalities, nor any redundancy of words. The book is published by J. H. Kerrick & Co., Indianapolis, Ind., and will be sent by mail for one dollar.

Rattle and Prattle for Young Car-Builders and Little Carriage-Makers, is the title of a beautifully illustrated holiday publication issued by Murphy & Co., Newark, N. J., for gratuitous circulation. It is full of amusing matter in prose and verse, designed for the little folks, and should find its way into every household.

Extracts from Chordal's Letters.—This is a well-printed volume of 320 pages, containing choice selections from the series of articles under the above title that have appeared during the past two years in the "American Machinist." It is, in the language of the preface, a shop book written for shop men by a shop man, and touches upon almost every thing pretaining to shop economy and management. The style is simple, lively and entertaining, and admirably adapted to the class of readers for which the book is designed. It will be read with instruction and profit by the apprentice and experienced mechanic, because it is free from technicality and abounds in valuable practical suggestions and illustrations of every-day shop life, methods and incidents. It contains a number of engravings which tell their own story, and also a likeness of the author. Published by the American Machinist Publishing Co., 96 Fulton street, New York. Price $1.50.

Railway Elliptic Springs.

MESSRS. A. FRENCH & CO., of Pittsburg, Pa., the well-known manufacturers of Elliptic Cast-steel Springs, announce that in consequence of their inability during the past year to promptly supply the large and increased demand for their railway elliptic springs, they have decided to erect new works, which will be completed about the 1st of February, 1881. This additional factory will be erected on the square adjoining their present works, and will have about the same dimensions and capacity of the shop now in use. It will be furnished with the most complete equipment of machinery and tools, and the two buildings will have a length in one line of 510 by 100 feet, and form the largest and best arranged establishment in the world, for the manufacture of railway elliptic springs. The production will be systematized by the arrangement of departments for the different classes of work, with special machinery for each class. The new shop will be devoted to the manufacture of locomotive and coach springs, while the mammoth capacity of the present works will be used exclusively for production of freight-car springs, the increased facilities in both insuring the prompt execution of orders, with none of the trying and vexatious delays that have been unavoidable during the past year. Whatever can be done by improved machinery and exact scientific methods, to improve the quality and cheapen the price of railway elliptic springs, will be done, and thus promote the general introduction upon the railways of this country of what is admitted to be the best and only efficient spring in use. All springs will be fully warranted.

A HIBERNIAN switch-tender who saw a trai coming in on time said, "You are first at last, bu you have been behind before."

A New and Improved Car Roof.

A new style of car roof has recently been patented by Mr. A. P. Winslow, of the firm of A. P. Winslow & Co., of Cleveland, Ohio, which must sooner or later come into general use for stock and house cars, for the reason that it possesses the two indispensable qualities of cheapness and durability in a much greater degree than any roofing now in use. The material used for giving durability to the roof, and causing it to be impervious to water, is native asphalt, a substance which is not affected by extremes of heat or cold, nor is it visibly impaired by time, but has been known to remain for ages without alteration. The felting is used twice the thickness of the common roofing felt, and in its manufacture the asphalt is combined or incorporated with it, as well as with the paint with which the felt is covered when on the car. The durability of this material having been tested, it is not necessary to make a trial of it for three or four years to find out its value. In regard to cost, a roof of this description can be put on for less than the cost of a first-class double board roof, and for one-third the cost of a galvanized iron roof. Common lumber can be used for both the upper and the lower boarding, and costing from $12 to $15 less than a double board roof of clear lumber. The *felt* for roof can be furnished for $10 per car, the expense of putting on both roofs being about the same.

THE CLARE FIBRE CO., or Jersey City, N. J., is supplying the market with some new and valuable substitutes for moss and hair in bedding and upholstery. One of these is "Clare Fibre," or pine leaf hair, a product of the pine tree, rendered elastic by a process which gives to it a peculiar short, crisp curl, while it is entirely free from dye stuffs or other foreign ingredients. It has a tough, strong fibre, and will not pulverize by use like other cheap materials used for a like purpose. Its chief recommendations are its durability and cheapness, its cost being only half that of moss. The other substitute is "Japanese hair," which in feeling and appearance closely resembles the ordinary curled hair, but is supplied at less than half the cost of the latter. In addition to its toughness and permanent elasticity, its lightness in weight will make it last more than twice as long as hair or moss. Both lines of goods are peculiarly adapted to car seats and mattresses, and are put up in well covered bales, free from dirt or waste, and ready for immediate use. The cheapness of these articles, as compared with the cost of hair and moss, together with their durability, entitle them to a prominent place in the catagory of railway supplies.

SPEAR'S coal-burning anti-clinker grate stoves are admirably adapted to car heating and ventilation. The cast-iron cylinders are of extra thickness, and are enclosed in a casing of the best Russia sheet-iron, so that persons who sit near the stoves are not exposed to a greater heat than those at a distance. The cold fresh air is introduced at the bottom, and is heated by passing up on one side and down on the other to an opening in the base, where it is discharged into the car, the impure air being at the same time forced out at the top of the car. The air around the stove does not come in contact with the heated surface so as to be cooked and rendered unfit for breathing. The warmed air is so distributed as to produce a uniformity of temperature, or nearly so, and the incoming and outflowing currents maintain good ventilation. The stoves are securely fastened in their places, and the doors provided with wrought-iron latches held down by a cam, so they will not fly open in case of an overturn.

THE Wagner Sleeping Car Co. have adopted and attached the Winslow Safety Tank to their Baker heaters on cars running from New York to Chicago and St. Louis. The Lake Shore and C., C., C. & I. roads have also placed the tanks under their Baker heaters, and the cars not having heaters have been supplied with Winslow Safety Stoves. The P. C. & St. L., including branches and leased lines, have adopted the Winslow Hot Air Stove on account of its economy in heating, safety and perfect ventilation. They are also being tested with good success by a number of other roads.

THE Western Weighing Association's figures show the average weight of machinery per car load to be 23,750 pounds.

MR. J. R. SHALER has, as previously reported, resigned his position as Assistant General Manager of the Louisville & Nashville road.

SOME one, prompted by a spirit of inquiry, said to a time-table man: "My friend, at what time did this train run off the track?" "Do you mean No. 29?" asked the time-table man. "No, this train that ran off the track?" "Oh, now I understand you, and will give you the particulars. No. 13 had the right of way, and No. 65 ran off the track near Hackensack Bridge, and No. 27 jumped the switch, and 22 is taking water at the tank. At the same time 8 may come along on 3's track." Then, looking solemnly, the inquirer asked: "Does this train go to Smithville?" "I do not know," answered the time-table expert, "but I think No. 4 goes west!"

A COUNTRY editor says that when he looks at a woman's head, he is puzzled to tell which is switch.

A MAN who has been traveling in New Jersey says he saw some land there so poor that you couldn't raise a disturbance on it.

THERE was no preaching in a Kansas town the other Sunday, and all in consequence of a practical joke perpetrated by a lively young girl, who sat down late one Saturday evening, and sent a note to all the pastors, each containing these words: "All is discovered—fly." Every one of the four fled.

AN exchange says: "Looking over an old ledger, we see a long array of names of former subscribers who are indebted to us. Some of them have moved away and are lost to sight, although to memory dear; others are carrying contribution boxes in our most respectable churches; and others again, have died and are angels in heaven, but they owe us just the same.

A HATCHET-FACED woman, of about fifty-one summers, with a wealth of freckles in her face and a snuff-stick in her mouth, got into a crowded car in Galveston, Texas. There were half a dozen gentlemen in the car, but none of them offered to give her a seat. After she had waited a reasonable time, she said: "Ef eny of you galoots is waitin' for me to squat in yer laps, you are barkin' up the wrong tree, for I want you to understand I'm a lady." A dread that she was not in earnest caused six gentlemen to leave the car.

AT one of the London theatres the sea was made of loose painted canvas, and two sets of boys—one short and the other tall—were employed to stoop and rise alternately beneath the canvas, and thus give the idea of waves. One night the ocean was in singular commotion, and all the waves seemed to be in the middle of the stage. Fearful noises were also heard. The affrighted lessee rushed behind the scenes to seek an explanation, and was told by the manager "Its all right now, sir; the eighteen-penny waves were giving the shilling waves a licking."

IT is queer how folks dream. The other night a man dreamed he stood at the gate of heaven and asked St. Peter if the souls of the rich ever get in there. "Yes," was the reply, "it is supposed that the souls of a great many rich people have got in here. Many of them are so small that we have not been able to invent any way to keep them out."

A NEWARK lady, on entering the ladies' cabin of a ferry-boat and finding the seats occupied by men, remarked to a friend that she had often noticed in the paper quotations of prices of dressed hogs, and it had never dawned on her mind what the article was until then.

AN Irish gentleman of a mechanical turn took off his gas-meter to repair it himself, and put it on again upside down. At the end of the quarter it was proved with arithmetical correctness that the gas company owed him thirty-four shillings.

"YES, sah," said the old colored man, "de firs' yeah, when I giv fifty dollahs to the church, dey call me Mistah Richad Johnson, Esquah; de secon' yeah times was bad an' I couldn't giv no more than twenty-fiv dollahs, an' dey call me Bruddah Johnson; de next yeah I couldn't giv nuffin', an' dey call me ole niggah Johnson."

FLEAS, says the *Elevated Railway Journal*, never go near a Manhattan Railway employe. They seem instinctively to realize that it is a great waste of time. There is a case on record, however, of a Jefferson Market flea, who in some way found himself on a Sixth avenue train at the Chambers street down station, and as the neighborhood was strange to him, he fastened on the conductor. But it was a fatal error. He tried his best to make an impression, too, but that conductor had been in the service more than a year, and the flea might as well have probed a grindstone. You never saw a more disgusted flea. He seemed to think that the whole world had turned against him, closed both eyes, made a frantic jump into space, lit on the structure, fell thence into the street and was never heard of after.

"IN closin' dis meetin'," said the old man, as the usual hour was marked by the clock, "let ebery one o' your b'r in mind dat blowin' up a bladder doan' make a bar'l. Git it as full o' wind as you may, an' it's nuffin but a bladder. De Lawd made each one for a speshul purpose, an' de chap who was created to use a shovel will get busted ebery time he believes that he was cut out for a statesman. We will now be scattered."—*Detroit Free Press.*

A MASTER CAR-BUILDER, who has had twenty years' practical experience in the various branches of construction and repairing, and who now holds a permanent psoition, desires to make a new engagement. Can furnish the best of references. Address NATIONAL CAR-BUILDER, New York.

Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur:

Chicago & Alton.—Mr. C. H. Chappell has been promoted from the position of Assistant Superintendent to that of General Superintendent.

Cincinnati, Wabash & Michigan.—Mr. O. W. Lamport has been appointed Superintendent, with office at Wabash, Ind. He has heretofore been on the Lake Shore road.

Dayton & Southeastern.—Mr. Frank McCreary has been appointed Master Mechanic, vice Mr. W. E. Cooper, resigned.

Detroit, Lansing & Northern.—Mr. Thomas M. Fish, of the Chicago & Northwestern, has been appointed Superintendent, with office at Ionia, Mich.

Greenville & Columbia.—The name of this road has been changed to Columbia & Greenville. Mr. T. M. R. Talcott is General Manager.

Kansas City, Fort Scott & Gulf; and Kansas City, Lawrence & Southern.—Mr. H. P. Jacques has been appointed Purchasing Agent for these roads, with office at Kansas City, Mo.

Lake Shore & Michigan Southern.—Mr. W. H. Canniff has been appointed Superintendent of the Lansing Division, with office in Lansing, Mich. Mr. Canniff has been Road-Master on the road for some time, and is Secretary of the International Road-Masters' Association.

Manhattan Elevated.—Mr. C. L. Green, formerly connected with the Central of New Jersey, has been appointed Superintendent of all the lines of this company. The positions of Division Superintendents have been abolished, retiring Mr. T. T. Onderdonk and Mr. Robert Stewart.

Memphis & Little Rock.—Mr. Wm. E. Smith has been appointed General Manager, in place of Mr. Jas. Harrington.

Missouri, Kansas & Texas.—This road has been absorbed by the Missouri Pacific, and will hereafter be known as the Kansas & Texas Division. Some of the officers, including Mr. A. Mitchell, General Manager, and Mr. Geo. W. Cushing, Supt. of Machinery, have, by the change, been retired from their positions.

North Pacific Coast.—Mr. W. C. Fillmore has been appointed Superintendent, with office at San Rafael, Cal., in place of Mr. J. M. Fillmore, who has gone to the Oregonian Railway.

Richmond & Danville.—Col. T. M. R. Talcott has been appointed General Manager, and will have charge of the passenger, freight and transportation departments.

CONTINUOUS DRAW-BAR PATENTS.

The following circular has been issued by the Secretary of the Western Railroad Association:

CHICAGO, Sept. 9, 1880.

To the Members of the Association:

GENTLEMEN: Claims have been pending for several years that the Continuous Draw-Bar sold by the Continuous Draw-Bar Company under the Middleton and the Griffith and Patterson patents is an infringement of patent 71,380, granted 3d December, 1867 (reissue No. 8,095, granted 19th February, 1878), to Edward L. Caum.

This Association has continuously advised against entertaining this claim, but to quiet all questions, and at our instigation, the Continuous Draw-Bar Company has recently purchased the Caum patent, its owners inserting in the assignment a full and absolute release to it tve members of the Eastern and Western Railroad Associ ions from any and all liability for, or on account of, any infringement heretofore of said patent.

Yours truly,

J. H. RAYMOND, Secretary, etc.

CLARENCE BROOKS & Co.

MANUFACTURERS OF

RAILWAY CAR AND FINE COACH VARNISHES.

Cor. West and West 12th sts., New York.

JOHN W. MASURY & SON,

MAKERS OF STRICTLY FIRST-CLASS

RAILWAY VARNISHES,

AND MANUFACTURERS OF

CAR BODY COLORS.

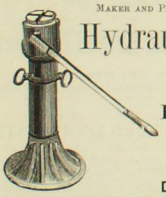
By permission, we refer to the following Companies, for whom we have made Special Colors:

PENNSYLVANIA RAILROAD CO., Enoch Lewis, Purchasing Agent, Philadelphia, Pa.
PENNSYLVANIA CO., Wm. Mullins, General Purchasing Agent, Pittsburg, Pa.
BALTIMORE & OHIO RAILROAD CO., N. S. Hill, Purchasing Agent, Baltimore Md.
CHICAGO & ALTON RAILROAD CO., A. V. Hartwell, Purchasing Agent, Chicago, Ill.
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.
NAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.
UNION PACIFIC RAILROAD CO., } A. D. Clark, Purchasing Agent, Omaha, Neb.
KANSAS " " "
CHICAGO, BURLINGTON & QUINCY RAILROAD CO., Wm. Irving, Purchasing Agent, Chicago, Ill.
LOUISVILLE, CINCINNATI & LEXINGTON RAILROAD CO., Wm. Mahl, Purchasing Agent, Louisville, Ky.
GRAND TRUNK RAILWAY N. Wall, Port Huron, Mich.
LITTLE ROCK & FORT SMITH RAILROAD CO., T. Hartman, Purchasing Agent, Little Rock, Ark.
GILBERT & BUSH CO., Troy, N. Y. } Railroad Car Builders.
WASON MANUFACTURING CO., Brightwood, Mass.
BILLMEYER & SMALL MANUFACTURING CO., York, Pa.
JACKSON & SHARP CO., Wilmington, Del.
BARNEY & SMITH MANUFACTURING CO., Dayton, O.

The advantages derived from the use of such Special Colors are many a few of which are found below: **ABSOLUTE UNIFORMITY OF SHADE. DURABILITY,** as we use perfectly pure materials. **SAVING OF MONEY,** because of small quantity required. **SAVING OF TIME,** in the putting on of the same. **SAVING OF LABOR AND MATERIAL,** as no extra amount of Varnish will be required to hide a sanded surface. **LARGER DEGREE OF CERTAINTY** that there will be an absence of cracked work, as our mixtures are all uniform, being done by weight only.
We make any desired shade, it only being necessary that purchasers furnish us with sample of color desired, stating the time they would like to have the paint dry in.
We shall be glad to furnish samples and give prices to any who may wish to avail themselves of the above advantages.
Very respectfully,

JOHN W. MASURY & SON, New York and Chicago.

RICHARD DUDGEON,
No. 24 Columbia St., New York,
MAKER AND PATENTEE OF IMPROVED

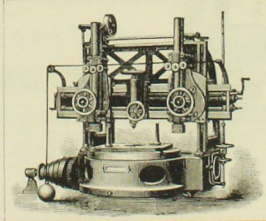


Hydraulic Jacks.
PUNCHES,
Boiler-Tube Expanders,
AND
DIRECT ACTING
STEAM HAMMERS.

JACKS FOR PRESSING ON CAR-WHEELS OR CRANK-PINS MADE TO ORDER.
Communications by letter will receive prompt attention.

JOYCE & CRIDLAND,
900 E. Third St.,
DAYTON, O.

We represent here a cut of our Compound
Lever Jack,
OF GREAT POWER.
Its capacity is 12 to 15 tons with two men.
We make out one size, a two-inch round bar.
Height, 29 inches.
PRICE - - $30.



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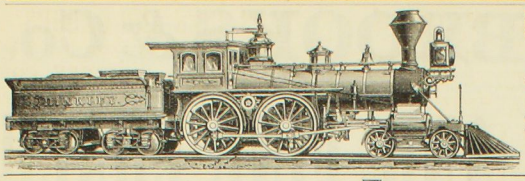


HINKLEY LOCOMOTIVE COMPANY.

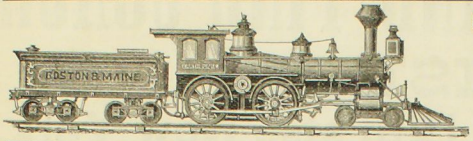
(ESTABLISHED IN 1839.)

439 ALBANY ST., BOSTON, MASS.

This Company, having been reorganized, is prepared to receive orders for Locomotive Engines and Tenders, Boilers and Tanks, and to execute such orders promptly at fair prices for the best work.

FRANKLIN D. CHILD, Superintendent.

GREELY S. CURTIS, Treasurer.



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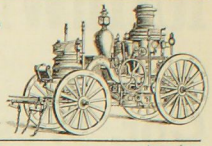

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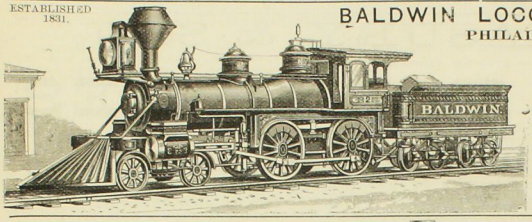

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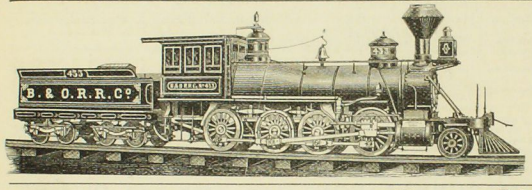

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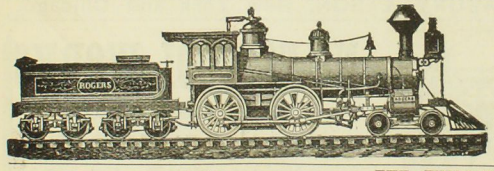

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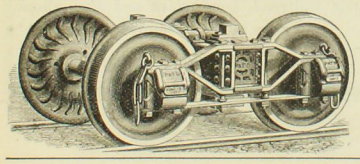

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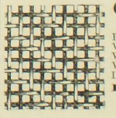

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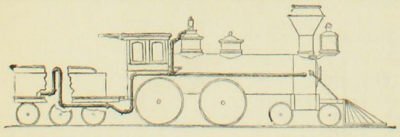

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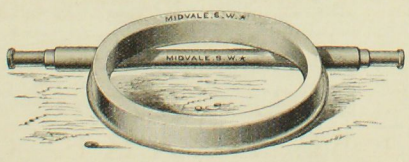

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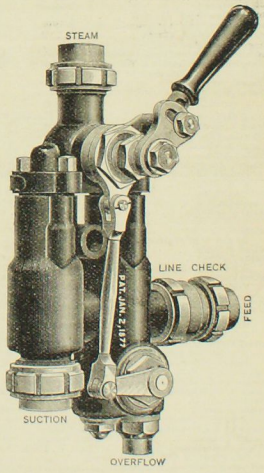

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Delaware & Chesapeake	Jos. A. Baynard		Eaton, Md.
Delaware & Hudson Canal Co	**R. C. Blackall		Albany, N. Y.
Delaware & Hudson Canal Co		T. Orchard	Carbondale, Pa.
Rensselaer & Saratoga Div.	J. L. Corey	Chr. Körner	Green Island, N. Y.
Denver Pacific	§ t. McDougall	John Clock	Denver, Col.
Denver & Rio Grande	N. W. Sample	N. W. Sample	Denver, Col.
Des Moines & Fort Dodge	John McGrayel	E. A. Avery	Grand Junction, Ia.
Detroit & Bay City	R. P. Baillie		Bay City, Mich.
Detroit, Grand Haven & Mil.	Fred Parker		Detroit, Mich.
Detroit, Lansing & Northern	G. C. Watrous	G. C. Watrous	Ionia, Mich.
Dorchester & Delaware			Cambridge, Md.
Dunkirk, Allegheny Val. & Pitts	J. C. Haggett	J. C. Haggett	Dunkirk, N. Y.

E

East Broad Top	Wm. C. Maynes		Orbisonia, Pa.
Eastern	J. D. Billings		East Boston, Mass.
Eastern Kentucky	D. L. Weaver	D. L. Weaver	Riverton, Ky.
E. Tennessee, Virginia & Georgia	C. A. Hodge	Joseph Armbruster	Knoxville, Tenn.
Erie & Pittsburg	J. N. Wood	J. N. Wood	Erie, Pa.
Eureka & Palisade	J. M. Alson		Eureka, Nev.
European & North Am. of Maine	A. O. Bailey	A. O. Bailey	Mattawamkeg'g, Me.
Evansville & Terre Haute	John L. White	Joseph Stiker	Evansville, Ind.
Evansville, Terre Haute & Chic.	§§W. D. Macfarlane		Terre Haute, Ind.

F

Fitchburg	§§Geo. A. Coolidge		Charlestown, Mass.
Vermont & Mass. Div	W. A. Foster		Fitchburg, Mass.
Flint & Pere Marquette	T. J. Hatswell	T. J. Hatswell	E. Saginaw, Mich.
Florida Central	James S. McElroy	James S. McElroy	Jacksonville, Fla.
Flushing, North Shore & Central	Thomas Meehan	Edward Riley	L. I. City, N. Y.
Fort Wayne & Jackson	C. W. Hollister		Jackson, Mich.
Fort Wayne, Muncie & Cincinnati	Wm. McPhail	Wm. McPhail	Fort Wayne, Ind.

G

Galv., Harrisburg & San Antonio	§§D. T. Davis	Jas. Alexander	Harrisburg, Tex.
Galveston, Houston & Henderson	J. G. Conlon		Galveston, Tex.
Geneva, Ithaca & Sayre	J. N. Weaver		Waverly, N. Y.
Georgia	John S. Cook	T. M. Preval	Augusta, Ga.
Grand Haven	A. S. Parish		Allegan, Mich.
Grand Tower & Carbondale	Hugh Smith	Hugh Smith	Grand Tower, Ill.
Grand Trunk	†Herbert Wallis	Wm. McWood	Montreal, Canada.
Grand Trunk	Warren Noyes		Gorham, N. H.
Grand Trunk		Duncan Menish	Portland, Me.
Grand Rapids & Indiana	J. M. Boon		Fort Wayne, Ind.
Grand Rapids & Indiana	J. R. Fish	J. R. Fish	Gr'nd Rapids, Mich.
Grayville & Mattoon	C. H. Cory		Mattoon, Ill.
Great Western, of Canada	*C. K. Domville		Hamilton, Can.
Great Western, of Canada	C. F. Hanson	Henry Childs	London, Ont.
Green Bay & Minnesota	Edw. Osborne		Green Bay, Wis.
Gulf, Colorado & Santa Fe	Geo. B. Nicols	Geo. B. Nichols	Galveston, Texas.

H

Hanover Junction & Gettysburg	John J. Bingley	Henry Britcher	Hanover, Pa.
Hannibal & St. Joseph	Tho. G. Gorman	Tho. G. Gorman	Hannibal, Mo.
Havana, Rantoul & Eastern	J. McCarthy		Rantoul, Ill.
Housatonic	N. Slingland	J. J. Ferris	Falls Village, Conn.
Houston, East & West Texas	J. E. Wiggin		Houston, Tex.
Houston & Texas Central	L. C. Noble	James McGee	Houston, Tex.
Huntingdon & Broad Top	Wm. Barkla		Saxton, Pa.

I

Illinois Central	**S. J. Hayes	W. B. Snow	Chicago, Ill.
Chicago Division	Henry Schlacks		Chicago, Ill.
South Division	David Oxley		Centralia, Ill.
North Division	J. B. Edams		Amboy, Ill.
Iowa Division	Thomas W. Place		Waterloo, Ia.
Springfield Division	W. B. McKenna		Clinton, Ill.
Illinois Midland	R. N. Pringle		Paris, Ill.
Illinois & St. Louis	J. H. Smith		Belleville, Ill.

Railroad.	Master-Mechanic.	Master Car-Builder.	Residence.
Illinois & St. Louis		Charles Robe	E. St. Louis, Ill.
Indianapolis, Decatur & Springfield	Pulaski Leeds	Pulaski Leeds	Indianapolis, Ind
Indianapolis, Peru & Chicago	John McKenna	John McKenna	Peru, Ind.
Indianapolis & St. Louis	A. J. Sanborn	A. J. Sanborn	Mattoon, Ill.
Indiana, Bloomington & Western	C. A. Thompson	C. A. Thompson	Urbana, Ill.
International & Great Northern	R. H. Johnson	H. H. Sessions	Palestine, Tex.
Intercolonial	†H. A. Whitney	Edw. Shaffer	Moncton, N. B.
Iron	Perry Scott	Clem. Roetling	Ironton, O.

J

Jacksonville, Pensacola & Mobile	Jas. D. Hollister		Tallahassee, Fla.
Jeffersonville, Mad. & Indianapolis	Wm. Swanston	Edw. Austin	Jeffersonville, Ind.
Jacksonville, N. West. & S. East	B. J. Miller		Jacksonville, Ill.
Joplin	P. T. Butterly	P. T. Butterly	Girard, Kan.
Junction & Breakwater	J. A. Maguire		Lewes, Del.

K

Kansas City, Ft. Scott & Gulf	W. D. Rowley		St. Joseph, Mo.
Kansas City, Fort Scott & Gulf	J. S. McCrum	A. N. Montier	Kansas City, Mo.
Kansas City, Lawrence & South'n	J. S. McCrum		Kansas City, Mo.
Kan. City, St. Jo. & Coun. Bluff	F. A. Chase	Theo. Aylesbury	St. Joseph, Mo.
Kansas Central	Wm. McCall		Leavenworth, Kan.
Kansas Pacific	**John MacKenzie	T. B. Roberts	Armstrong, Kan.
Kaw Valley Division	James Long		Armstrong, Kan.
Smoky Hill Division	John B. Daily		Ellis, Kan.
Denver Division	R. McDougal	John Clock	Denver, Col.
Kentucky Central	J. R. Leonard	J. L. Hackathorn	Covington, Ky.
Knox & Lincoln	E. Bolton	C. L. Turner	Bath, Me.

L

Lake Erie & Western	**Everett Clemens		Fremont, Ohio.
Lake Erie & Western	†H. L. Cooper		Lafayette, Ind.
Lake Ontario Southern	Geo. Thompson	Wm. Currier	Sodus Point, N. Y.
Lake Shore & Michigan Southern	James Sedgley	††John Kirby	Cleveland, Ohio.
Michigan Southern Division	Geo. W. Stevens		Elkhart, Ind.
"		Frank O. Bray	Adrian, Mich.
Toledo Division	J. M. Sanborn	W. O. Smith	Norwalk, Ohio
Erie Division	L. O. Gassett	J. Withycombe	Cleveland, Ohio.
Buffalo Division	Edward Studley	A. C. Robson	Buffalo, N. Y.
Lehigh Valley	John I. Kinsey		South Easton, Pa.
Lehigh Valley	P. Hofecker		Weatherly, Pa.
Lehigh Valley	John Campbell		Delano, Pa.
Lehigh Valley	D. Clark		Hazleton, Pa.
Lehigh Valley	A. Mitchell		Wilkesbarre, Pa.
Lehigh Valley		Jno. S. Leutz	Packerton, Pa.
Little Rock & Fort Smith	James Eblin	James Malone	Argenta, Ark.
Little Rock, Miss. River & Texas	Joseph Taylor	Joseph Taylor	Arkans's City, Ark.
Los Angeles & Independence	Jas. Velsir	J. S. Young	Los Angeles, Cal.
Louisville, New Albany & Chicago	Geo. H. Ruhlandt	Geo. H. Ruhlandt	New Albany, Ind.
Long Island	†Thos. Meehan	Hugh Longest	L. Isl'd City, N. Y.
Louisville, Cincinnati & Lexing'n	A. Schaeffer	A. Schaeffer	Louisville, Ky.
Louisville & Nashville	**Reuben Wells	H. Middleton	Louisville, Ky.
Nashville & Decatur Div	W. H. Thomas	J. P. Furguson	Nashville, Tenn.
South & North Ala. Div	C. W. White		Birmingham, Ala.
Memphis & Ohio Div	Thos. Walsh	W. H. H. Price	Memphis, Tenn.
Clarksville Division	Wm. Adair		Bowling Green, Ky.
Ev., Hen. & Nashville Div	W. H. Thomas		Nashville, Tenn.

M

Macon & Brunswick	R. Wagnon	R. W[illegible]non	Macon, Ga.
Maine Central	J. W. Philbrick	J. W. Philbrick	Waterville, Me.
Maine Central		C. H. [illegible]nison	Augusta, Me.
Manchester & Lawrence	J. T. Gordon	J. T. Gordon	Concord, N. H.
Manhattan Beach	Lewis James		Bay Ridge, L. I.
Manhattan Elevated	T. W. Peeples		New York, N. Y.
Marietta & Cincinnati	E. M. Bosley	E. M. Bosley	Chillicothe, Ohio.
Marquette, Houghton & Onton'gn	W. H. Williams	H. D. Lyons	Marquette, Mich.
Memphis, Paducah & Northern	G. M. Taylor	G. M. Taylor	Paducah, Ky.
Memphis & Little Rock	Thos. Rennell	P. Twitchell	Argenta, Ark.
Memphis & Charleston	†H. N. Burford	J. J. Kasey	Memphis, Tenn.
Michigan Central	S. H. Edgerly		Jackson, Mich.
Michigan Central		††Robert Miller	Detroit, Mich.
Midland of New Jersey	W. C. Ennis		Wortendyke, N. J.
Milwaukee, Lake Shore & West'n	S. Charnly		Manitowoc, Wis.
Minneapolis & St. Louis	Tho. Downing	Tho. Downing	Minneapolis, Minn.
Mineral Point	Robert Hay	Robert Hay	Mineral Pt., Wis.
Mineral Range	George F. Coon		Hancock, Mich.
Mississippi & Tennessee	Geo. Haszinger	S. J. Bolton	Memphis, Tenn.
Missouri & Western	A. C. Persing		Pierce City, Mo.
Missouri Pacific	§§John Hewitt	John Hodge	St. Louis, Mo.
Missouri Pacific	R. D. Grant		St. Louis, Mo.
Missouri Pacific	Geo. W. Walshe		Sedalia, Mo.
Missouri Pacific	H. V. Farles		Atchison, Kan.
Mobile & Montgomery	C. W. White	Lewis Barham	Montgomery, Ala.
Mobile & Girard	J. C. Albrecht	A. J. Nix	Columbus, Ga.
Mobile & Ohio	R. H. Briggs	J. T. Booth	Whistler, Ala.
Mobile & Ohio	John Fitzgerald		Macon, Miss.
Mobile & Ohio	M. T. Carson		Jackson, Tenn.
Montgomery & Eufaula	D. M. Gugel	James A. Knight	Macon, Ga.
Morgan's Louisiana & Texas	N. Tilton	Wm. O'Brien	Algiers, La.

N

Nashua & Lowell	S. A. Davis	S. A. Davis	Nashua, N. H.
Nashville, Chattan'ga & St. Louis	James Cullen	J. G. Sawyer	Nashville, Tenn.
St. Louis Division	L. B. Salsbury	W. H. H. Price	Mt. Vernon, Ill.
Naugatuck	Henry Hanford	George W. Gray	Bridgeport, Ct.
Nebraska	D. Hawksworth		Plattsmouth, Neb.
Nevada Central	Wm. Sutcliffe		Battle Mountain, Nev.
Newburg, Dutchess & Connecticut	W. J. Vanbuskirk		Dutchess J'n, N. Y.
New Brunswick	P. A. Logan	P. A. Logan	Fredericton, N. B.
New Brunswick & Canada	Tho. Armstrong	G. Houlton	St. Andrew's, N. B.
New Haven & Northampton	Henry Fox	John Sweeny	New Haven, Ct.
New Jersey & New York	J. S. Drake		Jersey City, N. J.
New Jersey Southern	Rufus Blodgett		Manchester, N. J.
New Orleans, Texas & Mobile	§Josiah Bettis		Mobile, Ala.
New York, Lake Erie & Western	§F. M. Wilder		Susquehanna, Pa.
New York, Lake Erie & Western	J. H. Vreeland		Jersey City, N. J.
New York, Lake Erie & Western		J. N. Mileham	Jersey City, N. J.
New York, Lake Erie & Western	J. Van Vechten	J. Van Vechten	Port Jervis, N. Y.
New York, Lake Erie & Western	V. Blackburn		Susquehanna, Pa.
New York, Lake Erie & Western		D. B. Goodell	Elmira, N. Y.
New York, Lake Erie & Western	George H. Griggs		Hornellsville, N. Y.
New York, Lake Erie & Western	Chas. O. Vedder	M. Wilder	E. Buffalo, N. Y.
New York, Lake Erie & Western	Jos. Bradt		Rochester, N. Y.
New York & Harlem	Theo. Wheeler		New York, N. Y.
New York & Harlem		C. E. Garey	Morrisania, N. Y.
New York Central & Hud. River		††Leander Garey	New York, N. Y.
New York Central Division	§§G. B. Van Vorst	D. Hoit	West Albany, N. Y.
New York Central Division	§§Henry Watkeys		Syracuse, N. Y.
New York Central Division	§§Amos Gould		E. Buffalo, N. Y.
New York Central Division	§§S. L. White	Richard Donaby	Niagara Falls, N. Y.
New York Central Division		E. A. Olmstead	E. Buffalo, N. Y.
Hudson River Division	§§Wm. Buchanan	Peter Smith	New York, N. Y.
New York Central Division		C. H. Burchard	E. Rochester, N. Y.
New York, Ontario & Western	Edw. Minsbull		Middletown, N. Y.
New York & New England	§Geo. E. Boyden	Elias E. Pratt	Boston, Mass.
Norwich & Worcester Div.	Richard Colburn	John W. Marden	Norwich, Ct.
Hartford Division	E. M. Hunstone	S. Howland	Hartford, Conn.
New York, N. Haven & Hartford	§§H. Kettendorf	James Denver	New Haven, Ct.
Hartford Division	§Jno. Henney, Jr.	L. Packard	Hartford, Ct.
New York, Penn. & Ohio	†William Fuller	††J. H. F. Wiers	Cleveland, O.
New York, Penn. & Ohio	J. A. Cooper	D. S. Dockstader	Meadville, Pa.

Railroad.	Master-Mechanic.	Master Car-Builder.	Residence.
New York, Penn. & Ohio	[illegible] Wright	W. G. Huggard	Cleveland, O.
New York, Penn. & Ohio		S. V. Smith	Kent, O.
New York, Penn. & Ohio	William Hill	J. W. Holmes	Galion, O.
New York, Penn. & Ohio		J. T. Fosdick	Salamanca, N. Y
New York, Penn. & Ohio		Geo. Wilson	Dayton, O.
Northern Central	§§R. H. Soule	G. W. Demarest	Baltimore, Md.
Northern Central	J. M. Coale		Baltimore, Md.
Northern Central	James Strode	J. C. Dyott	Elmira, N. Y.
Northern New Hampshire	**Jas. N. Lauder		Concord, N. H.
Northern of Canada	Peter Clark	Peter Clark	Toronto, Can.
Northern Pacific	**A. P. Farrar	A. P. Farrar	Brainerd, Minn.
Dakota Division	A. Rupert		Fargo, Dak.
Pacific & P. Oreille Div.	C. Z. Sanders	Tho. G. Davis	New Tacoma, W.T
Northeastern		W. H. Day	Florence, S. C.
North Pacific Coast	James Walch		Sausolito, Cal.
Northern & Northwestern	P. Clark		Toronto, Can.

O

Ogdensburg & Lake Champlain	Abraham Klohs	A. Klohs	Malone, N. Y.
Ohio Central	J. B. Morgan		Bucyrus, O.
Ohio & Mississippi	J. F. Sechler		Vincennes, Ind.
Ohio & Mississippi		J. P. Coulter	Aurora, Ind.
Cincinnati Division	John Thomsey		Seymour, Ind.
Springfield Division	E. K. Sechler		Paris, Ill.
Old Colony	J. K. Taylor	A. Gleason	Boston, Mass.
B. C. F. & N. Bedford Div	Geo. W. Reynolds	Sam. Stevens	Taunton, Mass.
Olean, Bradford & Warren	Chas. Turner	Chas. Turner	Olean, N. Y.
Oregon & California	§§J. Brandt		Portland, Oregon.
Oregon Railway & Navigation Co	J. F. Curtis	Chas. Phipps	Dalles, Oregon.

P

Paducah & Elizabethtown	W. D. Robb	W. D. Robb	Elizabethtown, Ky
Painesville & Youngstown	J. H. Jones		Painesville, O.
Panama	Thos. S. O'Brien		Aspinwall, U. S. C.
Parker & Karns City	Philip Davies	Wm. Wolford	Parker City, Pa.
Pensacola & Selma	R. H. Kelly		Selma, Ala.
Pennsylvania	§T. N. Ely		Altoona, Pa.
Pennsylvania	H. D. Garrett	J. W. Van Houten	W. Philadelphia, Pa
Pennsylvania	E. L. Caum	Samuel W. Myers	Harrisburg, Pa.
Pennsylvania	G. W. Stratton	John P. Levan	Altoona, Pa.
Pennsylvania	D. O. Shaver	J. G. Stewart	Pittsburg, Pa.
New Jersey Division	L. A. Bosdevex	E. F. Bosdevex	MeadowShops, N.J
New Jersey Division		David H. Baker	Jersey City, N. J.
New Jersey Division	§§H. S. Hayward		Jersey City, N. J.
New Jersey Division	Tho. Kerr	P. S. Bogart	So. Amboy, N. J.
New Jersey Division	R. McDowell		Lambertville, N. J
New Jersey Division	W. McAllister		Camden, N. J.
West Penn. Division	C. B. Street	M. H. Falls	Blairsville, Pa.
Peoria, Decatur & Evansville	P. Reilly		Pekin, Ill.
Peoria, Jacksonville	R. F. Hurd	R. F. Hurd	Pekin, Ill.
Peoria & Springfield	E. Deizerdt	E. Deizerdt	Peoria, Ill.
Petersburg	R. B. Andrew	J. W. Fleming	Petersburg, Va.
Philadelphia, Wilmington & Balt	S. A. Hodgman	Wm. Lungren	Wilmington, Del
Philadelphia & Atlantic City	J. W. Wright	E. Lippincott	Camden, N. J.
	§§Howard Fry		Williamsport, Pa.
	W. F. Beardsley		Sunbury, Pa.
Philadelphia & Erie	W. L. Forster		Renovo, Pa.
	W. L. Holman		Kane, Pa.
	W. T. Smith		Erie, Pa.
Philadelphia & Baltimore Central	S. D. Danfield	S. D. Danfield	Chester, Pa.
Philadelphia & Reading	*L. B. Paxson	John H. Rankin	Reading, Pa.
Catawissa Branch	W. H. Ellis	C. D. Ellis	Catawissa, Pa.
Germantown & Norris'n Div	Jackson Richards		Philadelphia, Pa.
North Penn. Division	Jackson Richards	C. W. Hammann	Philadelphia, Pa.
Del. & Bound Brook Div	Jackson Richards		Philadelphia, Pa.
Piedmont Air Line	†R. D. Wade		Richmond, Va.
Rich. & Danville Div.		J. B. Vaughan	Richmond, Va.
North Carolina Div		J. C. Holt	Comp. Shops, N. C.
Pittsburg, Cincinnati & St. Louis	§§G. W. Rhodes		Columbus, O.
Little Miami Division	J. H. Setchel	John McVay	Cincinnati, O.
Little Miami Division		M. P. Ford	Columbus, O.
Col., Cin. & Ind. Division	Robert Curtis	Tho. Chamberlin	Columbus, O.
Col., Cin. & Ind. Div	Geo. H. Prescott	Chas. H. Starr	Logansport, Ind.
Col. Cin. & Ind. Division	C. M. St. Clair		Indianapolis, Ind.
Cin. & Musk. Val. Division	Leroy Kells	Daniel Jewell	Lancaster, O.
Pitts. Cin. & St. Louis Divis'n	Ross Kells		Dennison, O.
Pitts. Cin. & St. Louis Divis'n		A. K. Mansfield	Steubenville, O.
Pittsburg, Fort Wayne & Chicago	Geo. J. Parkin	John Marquis	Allegheny, Pa.
Pittsburg, Fort Wayne & Chicago	J. M. Boon	Israel Lee	Fort Wayne, Ind
Pittsburg, Fort Wayne & Chi ago		J. J. Kirkland	Crestline, O.
Pittsburg, Titusville & Buffalo	H. J. Fookhammer	John Monks	Oil City, Pa.
Pittsburg, Virginia & Charleston	Wm. Lininger		Pittsburg, Pa.
Pittsburg & Lake Erie	S. W. Haines		Pittsburg, Pa.
Portland & Ogdensburg	Geo. H. Poor	W. G. Brewer	Portland, Me.
Portland & Rochester	E. H. C. Tompson	David Dow	Portland, Me.
Port Dover & Lake Huron	H. M. Aldrich		Woodstock, Ont.
Port Royal & Augusta	Geo. Riley	J. H. Milton	Port Royal, S. C.
Poughkeepsie, Hartford & Boston	John L. Driscoll		Poughkeepsie, N.Y.
Prince Edward Island	A. Stronach	D. M. Fraser	Charlotte't'n, P. E. I.
Providence & Springfield	G. T. Richardson		Pascoag, R. I.
Providence & Worcester	A. Griggs	A. Griggs	Providence, R. I.
Providence, Warren & Bristol	Rufus Smith	Rufus Smith	Bristol, R. I.

Q

Quebec, Mont., Ottawa & Occidental	†A. Davis		Montreal, Can.
Quincy, Missouri & Pacific			Kirksville, Mo.

R

Raleigh & Augusta Air-Line	**R. R. Harding		Raleigh, N. C.
Raleigh & Gaston	**R. R. Harding	R. T. Bishop	Raleigh, N. C.
Rhinebeck & Connecticut	John Dykeman	John H. Decker	Rondout, N. Y.
Rich., Fredericksburg & Potomac	H. Khun	W. H. Trainham	Richmond, Va.
Richmond & Allegheny	Geo. D. Harris		Richmond, Va.
Richmond & Danville	See Piedmont Air-Line.		
Richmond & Petersburg	John O'Brien	H. L. Carter	Richmond, Va.
Rich., York River & Chesapeake	A. B. Armstrong	A. B. Armstrong	Richmond, Va.
Rio Grande	G. W. Rendall	M. Markwood	Brownsville, Tex.
Rochester & State Line	A. J. Robbins		Rochester, N. Y.
Rock Island & Peoria	Joseph Elder		Peoria, Ill.
Rome, Watertown & Ogdensburg	Geo. H. Hazleton	Geo. H. Haz ton	Oswego, N. Y.
Rome, Georgia	O. W. Harbin	O. W. Harbin	Rome, Ga.

S

Saginaw Valley & St. Louis			St. Louis, Mich.
San Francisco & Northern Pacific	Ed. Reynolds	John Martin	Donahue, Cal.
Savannah, Florida & Western	§Charles Collins	P. N. Raynall	Savannah, Ga.
Savannah & Memphis	R. A. Bridges		Opelika, Ala.
Scioto Valley	C. H. Cory	C. H. Cory	Portsmouth, O.
Seaboard & Roanoke	§§M. M. Pendleton		Portsmouth, Va.
Selma, Rome & Dalton	H. J. Sitton	W. W. Pierce	Selma, Ala.
Selma, Marion & Memphis	J. M. Levis		Marion, Ala.
Sheboygan & Fond du Lac	John Hickey	John Hickey	Sheboygan, Wis.
Shenango & Allegheny	Edw. Richardson		Greenville, Pa.
Shepaug	C. M. Allen		Litchfield, Ct.
Sioux City & Pacific	C. H. Foster	C. H. Foster	Missouri Valley Ia.
Sioux City & St. Paul	F. C. Butterfield	F. C. Butterfield	Shakopee, Minn.
Southern Pacific			
Northern Division	J. T. Wilson	F. N. Bellisle	San Francisco, Cal
Los Angeles & Yuma Div	Jas. Velsir	J. S. Young	Los Angeles, Cal.
Tulare Division	S. Johnson		Tulare, Cal.
South Carolina	§P. J. Cochrane	Geo. H. Gramling	Charleston, S. C
Southern Central	Chas. G. Brown	H. Mooney	Auburn, N. Y.
Southeastern (Canada)	Edwin Goss		Richford, Vt
Southwestern of Georgia	D. M. Gugel	James A. Knight	Macon, Ga.
South Pacific Coast	Martin Carter	Martin Carter	Newark, Cal.

Railroad.	Master Mechanic.	Master Car-Builder.	Residence.
Spartanburg, Union & Columbia	Wm. Platt	W. B. Brown	Spartanburg, S. C.
Spartanburg & Asheville	M. Fraser	W. B. Brown	Spartanburg, S. C.
Springfield, Athol & Northeastern	W. E. Granger		Springfield, Mass.
Springfield Southern	F. W. Johnstone		Springfield, O.
State Line & Sullivan	J. O. Blight		Towanda, Pa.
Stockton & Copperopolis	John M. Fulton		Stockton, Cal.
Stonington & Providence	J. H. Anderson	J. H. Anderson	Providence, R. I.
St. Croix & Penobscot	G. H. Corsen	H. C. Tincker	Milltown, Me.
St. Johns	Jas. M. Owens		St. Augustine, Fla.
St. Johnsbury & Lake Champlain	Geo. E. Howe		St. Johnsbury, Vt.
S. Joseph & Des Moines	W. D. Rowley		St. Joseph, Mo.
St. Joseph & Western	E. Sleppy	E. Sleppy	So. St. Joseph, Mo
St. Lawrence & Ottawa	Calvin Dame	Calvin Dame	Prescott, Canada.
St. Louis, Iron Mount. & So	**O. A. Haynes	Oscar Doolittle	St. Louis, Mo.
Arkansas Division	L. Finlay	L. Finlay	Little Rock, Ark.
Missouri Division	W. H. Harris		De Soto, Mo.
St. Louis, Alton & Terre Haute	**Beriah Warren		St. Louis, Mo.
St. Louis, Salem & Little Rock	Thomas Everson	A. W. Grosvernor	Steelville, Mo.
St. Louis & San Francisco	M. J. Prescott		N. Springfield, Mo.
St. Louis, Keokuk & Northwest'n	Wm. Foley		Keokuk, Iowa.
St. Louis Bridge Co. & Tunnel R.R.	H. M. Smith		St. Louis, Mo.
St. Paul & Duluth	W. McFarland	John Hill	St. Paul, Minn.
St. Paul, Minneapolis & Manitoba	A. A. Ackerly	J. C. Munro	St. Paul, Minn.
St. Paul & Sioux City	F. C. Butterfield.	F. C. Butterfield.	Shakopee, Minn.
Sussex	E. H. Osborn	R. L. Sutton	Newton, N. J.
Syracuse, Binghamton & N. Y.	James Buchanan	James Buchanan	Syracuse, N. Y.
Syracuse, Chenango & New York	Geo. W. West		Syracuse, N. Y.

T

Tennessee & Pacific	William McKeand	William McKeand	Nashville, Tenn
T. H. & Indianapolis { Vandalia Line.	§§C. R. Peddle	E. D. Carter	Terre Haute, Ind
T. H. & Indianapolis { Vandalia Div.	Clinton Idler		Indianapolis, Ind
T. H. & Indianapolis { Logansport Division	Chas. Butler		Effingham, Ill.
	A. J. Prescott	H. L. Clark	Logansport, Ind.
Texas & New Orleans	E. A. Campbell		Houston, Texas.
Texas & Pacific	H. J. Small	F. M. Alexander	Marshall, Texas.
Brazos Division	D. E. Greyer		Dallas, Tex.
Tioga	Pere Bonny	D. H. Stratton	Blossburg, Pa.
Toledo, Delphos & Burlington	Geo. H. Tier		Delphos, O.
Toronto, Grey & Bruce	*David Preston		Toronto, Can.
Toronto & Nipissing	J. Haggas		Toronto, Can.
Troy & Boston	Z. B. Davis	R. V. Coon	Troy, N. Y.
Ulster & Delaware	J. B. Dykeman	Jno. H. Decker	Rondout, N. Y.

Directory of Railway Superintendents and Purchasing Agents

THROUGHOUT THE UNITED STATES AND CANADA.

REFERENCES.—* General Manager. † Managing Director. ‡ Assistant General Superintendent. § Assistant Superintendent. ** Superintendent of Transportation. §§ Assistant General Manager.

A

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Adirondack	C. E. Durkee		Saratoga, N. Y.
Alabama Central	John M. Bridges		Selma, Ala.
Alabama Great Southern	Chas. P. Ball	R. W. Healey	Chattanooga, Tenn.
Albany & Susquehanna	*C. F. Young		Honesdale, Pa.
Allegheny Valley	David McCargo	David McCargo	Pittsburg, Pa.
Anderson, Lebanon & St. Louis	Jas. A. Larnerd		Anderson, Ind.
Arkansas Midland	*A. H. Johnson		Helena, Ark.
Ashtabula & Pittsburg	D. B. McCoy		Ashtabula, O.
Atchison, Topeka & Santa Fe	*W. B. Strong	F. M. Smith	Topeka, Kan.
Southern Division	A. A. Robinson		Las Vegas, N. M.
Eastern Division	D. J. Chase		Topeka, Kan.
Atlanta & Charlotte Air Line	*G. J. Foreacre	G. J. Foreacre	Atlanta, Ga.
Atlanta & West Point	*L. P. Grant		Atlanta, Ga.
Atlantic & North Carolina	A. B. Andrews		Newbern, N. C.
Atlantic, Mississippi & Ohio	Geo. Hoffman	J. P. Minetree	Petersburg, Va.
Atlantic, Tennessee & Ohio	J. J. Gormley		Charlotte, N. C.

B

Baltimore & Ohio	**W. M. Clements	N. S. Hill	Baltimore, Md.
Ohio & Chicago Division	C. H. Hudson		Chicago, Ill.
Pittsburg Division	G. M. Serpell		Connellsville, Pa.
Baltimore & Potomac	Geo. C. Wilkins	A. W. Sumner	Baltimore, Md.
Bangor & Piscataquis	Arthur Brown		Bangor, Me.
Bath & Hammondsport	M. H. Hall		Hammondsport, N. Y.
Bedford, Sp'gville, Owensb'g & Bd.	Jas. W. Kennedy	Jas. W. Kennedy	Bedford, Ind.
Bellefonte & Snow Shoe	Daniel Rhoads		Bellefonte, Pa.
Bell's Gap	Robert G. Ford		Bellwood, Pa.
Bennington & Rutland	F. C. White	F. C. White	Rutland, Vt.
Blairstown	J. D. Vail		Blairstown, N. J.
Boston, Revere Beach & Lynn	E. H. Wood		Boston, Mass.
Boston & Albany	*Wm. Bliss		Boston, Mass.
Boston & Albany	C. O. Russell		Springfield, Mass.
Boston & New York Air Line	Jos. H. Franklin		New Haven, Conn.
Boston & Providence	A. A. Folsom	A. A. Folsom	Boston, Mass.
Boston, Concord & Montreal	*J. A. Dodge		Plymouth, N. H.
Boston, Concord & Montreal	*W. A. Stowell	J. Thomas Vose	Boston, Mass.
Boston, Hoosac Tunnel & Western	E. B. Burnham		Mechanicsville, N. Y.
Boston & Maine	J. T. Furber	M. E. Wood	Boston, Mass.
Boston & Lowell	A. A. Robart	F. H. Nourse	Boston, Mass.
Boston, Barre & Gardner	H. M. Witter	H. M. Witter	Worcester, Mass.
Bradford, Bordell & Kinzua	B. C. Williams		Bradford, Pa.
Brooklyn, Flatbush & Coney Isl'd.	W. E. Dorwin		Brooklyn, N. Y.
Brunswick & Albany	R. D. Meader		Brunswick, Ga.
Burlington & Mo. River (in Neb.)	*A. E. Touzalin	G. Hargreaves	Omaha, Neb.
Burlington & Mo. River (in Neb.)	Geo. W. Holdrege		Omaha, Neb.
First Division	J. J. Philpi		Lincoln, Neb.
Burlington, Cedar Rapids & Nor'n	C. J. Ives	Rob't Williams	Cedar Rapids, Ia.
Burlington & Northwest'n	John F. Gerry	John F. Gerry	Burlington, Ia.
Burlington & Southwestern	J. W. Smith	J. W. Smith	Burlington, Ia.
Buffalo & Southwestern	*John F. Moulton		Buffalo, N. Y.
Buffalo, New York & Philadelphia	Geo. S. Gatchell	J. H. Pool	Buffalo, N. Y.

C

Cairo & St. Louis	*L. M. Johnson	L. M. Johnson	St. Louis, Mo.
Cairo & Vincennes	Roswell Miller	T. W. Fitch	Cairo, Ill.
California Pacific & Northern	*J. A. Fillmore		Sacramento, Cal.
Camden & Atlantic	F. A. Lister	F. A. Lister	Camden, N. J.
Canada Central	*Archer Baker		Brockville, Can.
Canada Southern	*Wm. P. Taylor		Buffalo, N. Y.
Canada Southern		A. F. Howland	St. Thomas, Ont.
U. S. Division	E. P. Murray		Toledo, O.
Canada Division	W. E. Carroll		St. Thomas, Ont.
Canadian Pacific	J. F. Lynskey		Winnepeg, Man.
Carbondale & Shawneetown	R. J. Cavett		Carbondale, Ill.
Carolina Central	V. Q. Johnson	C. H. Roberts	Wilmington, N. C.
Catsauqua & Fogelsville	C. W. Chapman	C. W. Chapman	Catasauqua, Pa.
Cayuga Southern	W. Stevenson		Sayre, Pa.
Cayuga & Susquehanna	W. R. Humphreys		Ithaca, N. Y.
Cazenovia, Canastota & De Ruyter	John Stebbins		Cazenovia, N. Y.
Central Pacific	*A. N. Towne		San Francisco, Cal.
Central Pacific	J. A. Fillmore		San Francisco, Cal.
Central Pacific		J. R. Watson	Sacramento, Cal.

Railroad.	Master Mechanic.	Master Car Builder.	Residence.
Union Pacific	§I. H. Congdon	‡‡Geo. E. Stevens	Omaha, Neb.
Eastern Division		A. M. Collett	Omaha, Neb.
Mountain Division	T. A. Davis	John E. Davis	Cheyenne, Wg. T.
Laramie Division		Floyd Heavaner	Laramie, Wg. T.
Western Division		R. V. Brinkley	Evanston, Wg. T.
Colorado Division	James S. Scott	E. G. Thomas	Golden, Col.
Denver, S. Park & Pacific Div			Denver, Col.
Kansas Division	**John MacKenzie	J. B. Roberts	Kansas City, Mo.
Utah Central	W. B. Armstrong	Sam. S. Tucker	Salt Lake City.
Utah Western	Robert Anderson		Salt Lake City, U.
Utica & Black River	John Bailey	David James	Utica, N. Y.
Utica, Ithaca & Elmira	Geo. W. Cleveland	F. W. Magargil	Bressport, N. Y.

V

Valley	A. Pilsbury	Chas. Blanchard	Cleveland, O.
Vicksburg & Meridian	Jas. B. Browne		Vicksburg, Miss.
Vicksburg, Shreveport & Pacific	W. Bell Smith	W. Bell Smith	Monroe, La.
Virginia & Truckee	I. N. Fording		Carson, Nev.

W

Wabash, St. Louis & Pacific	Chauncy Morris		Fort Wayne, Ind
Wabash, St. Louis & Pacific	Jacob Johann	B. B. Rose	Springfield, Ill.
Wabash, St. Louis & Pacific	‡W. D. Hewitt	††R. M. Hemphill	Peoria, Ill.
Wabash, St. Louis & Pacific		U. H. Kohler	Toledo, Ohio.
Wabash, St. Louis & Pacific	W. H. Selby	J. S. Hazen	Stanberry, Mo.
Wabash, St. Louis & Pacific		C. S. Buck	Moberly, Mo.
Walkill Valley	John Dykeman	Jno. H. Decker	Rondout, N. Y.
Wash. City, Va. Mid. & G. South.	Jas. E. Waddey	J. T. Nalle	Alexandria, Va.
Washington & Ohio	Edward Dunn	John Harrison	Alexandria, Va.
Welland	James Taylor	Wm. H. Pay	St. Catharine, C.W
Westchester & Philadelphia	§S. D. Danfield	S. D. Danfield	Chester, Pa.
Western & Atlantic	John H. Flynn	W. G. Grambling	Atlanta, Ga.
Western Maryland	§David Holtz	J. H. Nussear	Union Bridge, Md.
Western North Carolina	Geo. W. Gates		Salisbury, N. C.
Western, of Alabama	Robert King	F. M. Wade	Montgomery, Ala.
Western R. R. N. C.	Isaac W. Clark	Isaac W. Clark	Fayetteville, N. C
Western Union	John Taylor	E. A. Eddy	Racine, Wis.
West Feliciana	J. A. Tilton	Wm. McKelvey	Laurel Hill, La.
West Jersey	W. McAllister	C. C. Williams	Camden, N. J.
White Water	§L. W. Wingert		Harrison, O.
Wilmington, Columbia & Augusta	John Bisset	W. H. Day	Florence, S. C.
Wilmington & Welden	John Bisset	C. R. Clowe	Wilmington, N. C.
Wisconsin Central	A. Tenwick	J. L. Adam	Stevens' Pt, Wis.
Wisconsin Valley	M. B. Snyder		Tomah, Wis.
Worcester & Nashua	John G. Brady	John G. Brady	Worcester, Mass.

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Western & Visalia Divisions	A. D. Wilder		Oakland, Cal.
Truckee Division	Frank Free		Wadsworth, Nev.
Humboldt Division	G. W. Coddington		Carlin, Nev.
Salt Lake Division	A. G. Fell		Ogden, Utah.
Sacramento & Oregon Div	R. H. Pratt		Sacramento, Cal.
Central Vermont	J. W. Hobart		St. Albans, Vt.
Central Vermont	‡J. M. Foss		St. Albans, Vt.
Western Division	John Schrier		Ogdensburg, N. Y.
Northern Division	J. B. Futcoys		St. Johns, P. Q.
Rutland Division	J. Burdett		Rutland, Vt.
New London Northern	G. W. Bentley	G. W. Bentley	New London, Conn.
Central of Georgia	Wm. Rogers	Henry Yonge	Savannah, Ga.
Atlanta Division	W. F. Shellman		Macon, Ga.
Central of Iowa	D. N. Pickering	D. N. Pickering	Marshalltown, Ia.
Central of New Jersey	James Moore	B. W. Burnet	Elizabeth, N. J.
Central Division	‡W. W. Stearns		Elizabeth, N. J.
Lehigh & Susq. Division	W. S. Polhemus		Manch Chunk, Pa.
Champaign, Havana & Western	A. H. Wood		Urbana, Ill.
Charleston & Savannah	C. S. Gadsden		Charleston, S. C.
Charlotte, Columbia & Augusta	G. R. Talcott	G. R. Talcott	Columbia, S. C.
Chesapeake & Ohio	W. M. S. Dunn	J. A. Netherland	Richmond, Va.
Cherawe & Darlington	J. F. Divine		Society Hill, S.
Cherokee	John Postell		Atlanta, Ga.
Cheshire	*R. Stewart	H. H. Stone	Keene, N. H.
Chester & Lenoir	James Mason		Chester, S. C.
Chicago & Northwestern	*Marvin Hughitt	R. W. Hamer	Chicago, Ill.
Chicago & Northwestern	J. S. Oliver		Chicago, Ill.
Chicago & Northwestern	§Chas. C. Wheeler		Chicago, Ill.
Wisconsin & Mill. Division	E. J. Taylor		Chicago, Ill.
Peninsula Division	W. B. Lindsay		Escanaba, Mich
Madison Division	C. A. Swineford		Baraboo, Wis.
Galena Division	Chas. Murray		Chicago, Ill.
Des Moines & Iowa Division	J. M. Whitman		Clinton, Iowa.
Winona & St. Peter Division	S. Sanborn		Winona, Minn.
Galena & Wisconsin Br	J. B. Trull		Galena, Ill.
Chicago & Alton	*J. C. McMullen	A. V. Hartwell	Chicago, Ill.
Chicago & Alton	C. H. Chappell		Bloomington, Ill.
Chicago Division	A. M. Richards		Chicago, Ill.
Kansas City St. Louis Div	O. Vaughan		Chicago, Ill.
Chicago & Block Coal	*A. F. Beach		Nexico, Mo.
Chicago, Burlington & Quincy	*Thos. J. Potter	Wm. Irving	Veedersburg, Ind.
Chicago, Burlington & Quincy	§John D. Besler		Galesburg, Ill.
Chicago, Burlington & Quincy	§E. Ryder		Chicago, Ill.
Middle, Galesb'g & Q'y Div	H. Hitchcock		Galesburg, Ill.
St. Louis & R. Isl'd Division	W. R. Crumpton		St. Louis, Mo.
Iowa Division	W. C. Perkins		Burlington, Iowa.
Chi., Clinton, Dubuque & Minn	*F. O. Wyatt	F. O. Wyatt	Dubuque, Iowa.
Chicago & Eastern Illinois	O. S. Lyford	O. S. Lyford	Chicago, Ill.
Chicago & Iowa	W. H. Holcomb, Rec		Rochelle, Ill.
Chicago & Northeastern	J. M. Turner		Lansing, Mich.
Chicago & Pacific	*J. M. Whitman	James Penny	Chicago, Ill.
Chicago & Paducah	D. H. Conklin		Streator, Ill.
Chicago & Paducah		C. L. Rising	Chicago, Ill.
Chicago, St. Louis & New Orleans	*J. C. Clarke	J. C. Febuger, Jr.	New Orleans, La.
South Division	W. P. McKinley		McComb City, Miss.
North Division	J. G. Mann		Jackson, Tenn.
Chicago, Rock Island & Pacific	A. Kimball		Davenport, Iowa.
Chicago, Rock Island & Pacific	‡A. Manvel	A. Manvel	Chicago, Ill.
Southwestern Division	G. F. Walker		Trenton, Mo.
Iowa Division	H. F. Royce		Des Moines, Iowa
Keokuk & Des Moines Div	John Givin		Keokuk, Ia.
Chicago & West Michigan	§C. M. Lawler		St. Joseph, Mich.
Chicago, Milwaukee & St. Paul	W. C. Van Horne	J. T. Crocker	Milwaukee, Wis.
†h. La Crosse & P. du C. Div	H. C. Atkins		Milwaukee, Wis.
Northern Division	L. B. Rock		Milwaukee, Wis.
I. & M., & I. D. Division	C. H. Prior		Minneapolis, Minn.
Wabasha Division	J. H. Lakey		Wabasha, Minn.
Western Union Division	D. A. Olin		Pacine, Wis.
Sioux City & Dak. Div	G. E. Merchant		Sioux City, Ia.
Southern Minnesota Div	J. M. Egan	J. M. Egan	La Crosse, Wis
Chicago, Pekin & Southwestern	A. H. Cook	A. H. Cook	Chicago, Ill.
Chicago, St. Paul & Minneapolis	E. W. Winter	W. H. S. Wright	St. Paul, Minn.
Chicago & Grand Trunk	Henry Funnell		Battle Creek Mich.
Chicago & Grand Trunk		N. Wall	Fort Huron, Mich.
Chippewa Falls & Western	L. C. Stanley		Chip'wa F'lls, Wis.
Cincinnati & Eastern	George H. Wilber		Batavia, O.
Cincinnati, Wabash & Michigan	*Norman Beckley	Norman Beckley	Elkhart, Ind.
Cincinnati, Wabash & Michigan	O. W. La sport		Wabash, Ind.
Cincinnati, Richmond & Chicago	*Lewis Williams		Cincinnati, O.
Cincinnati, Rockp't & Southwest'n	H. C. Branham	H. C. Branham	Rockport, Ind.
Cincinnati & Terre Haute	John Holland		Terre Haute, Ind.
Cin., Cumber'd Gap & Charleston	W. J. Taylor		Knoxville, Tenn.
Cincinnati, Hamilton & Dayton	*Lewis Williams	Lewis Williams	Cincinnati, O.
Cin., Hamilton & Indianapolis	Lewis Williams		Cincinnati, O.
Cin., Sandusky & Cleveland	*D. W. C. Brown	Frank Herriman	Sandusky, O.
Cincinnati Southern	Sam'l Woodward	Julius Uhlein	Cincinnati, O.

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Cin., Indianapolis, St. Louis & Chi	J. W. Sherwood		Indianapolis, Ind
Cin., Indianapolis, St. Louis & Chi		George Tozzer	Cincinnati, O.
Cleve., Col., Cin. & Indianapolis	*E. B. Thomas	J. L. Yale	Cleveland, O.
Indianapolis Division	C. C. Gale		Indianapolis, Ind
Col. and Cincinnati Divs	Robert Blee		Cleveland, O.
Cleveland & Marietta	S. C. Baldwin	R. B. Hoover	Marietta, Ohio.
Cleveland & Pittsburg	John Thomas		Cleveland, O.
Cleveland & Pittsburg	*J. D. Layng	Wm. Mullins	Pittsburg, Pa.
Cleveland, Mt. Vernon & Columb's	G. A. Jones		Mt. Vernon, O.
Cleve., Tuscarawas Val. & Wheel.	*Oscar Townsend		Cleveland, O.
Cobourg, Petersboro & Marmora	James R. Barber	J. R. Barber	Cobourg, Ont.
Columbia & Greenville	*T. M. R. Talcott		Richmond, Va.
Columbus & Hocking Valley	Orland Smith		Columbus, O.
Columbus & Toledo	Orland Smith	Geo. R. Carr	Columbus, O.
Columbus & Rome	T. J. Nuckolls		Columbus, Ga.
Concord & Claremont	George E. Todd		Concord, N. H.
Concord	H. E. Chamberlin	H. E. Chamberlin	Concord, N. H.
Concord & Portsmouth	H. E. Chamberlin		Concord, N. H.
Connecticut Central	D. D. Warren, Pres		Springfield, Mass.
Connecticut River	John Mulligan	John Mulligan	Springfield, Mass.
Connecticut Valley	Samuel Babcock		Hartford, Conn.
Connecticut Western	J. F. Jones		Hartford, Conn.
Connecticut & Passumpsic Rivers	H. E. Folsom		Lyndonville, Vt.
Corning, Cowanesque & Antrim	A. H. Gorton	Andrew Beers	Corning, N. Y.
Covington, Col. & Black Hills	J. I. Booge		Sioux City, Iowa.
Cumberland Valley	J. F. Boyd	O. N. Lull	Chambersburg, Pa.
Cumberland & Pennsylvania	P. L. Burwell	P. L. Burwell	Cumberland, Md.
Cumberland & Maurice River	L. H. Dowdney		Port Norris, N. J.

D

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Danbury & Norwalk	L. W. Sandiforth		South Norwalk, C.
Danville & Southwestern	James A. Eads		Paris, Ill.
Davenport & Northwestern	D. Flanigan		Davenport, Ill.
Dayton & Michigan	E. E. Dwight		Toledo, O.
Dayton & Union	C. C. Gale		Indianapolis, Ind.
Dayton & Southeastern	J. E. Gimperling, *Rec.*	E. F. Pryor	Dayton, O.
Delaware & Chesapeake	O. S. Sanford		Easton, Md.
Delaware & Hudson Canal Co	R. Manville	R. Manville	Carbondale, Pa.
Delaware & Hudson Canal Co	*C. F. Young		Honesdale, Pa.
Albany & Susq. Division	C. D. Hammond		Albany, N. Y.
Rensselaer & Saratoga Div	Theo. Voorhees		Troy, N. Y.
Delaware, Lackawanna & Western		G. W. B. Cushing	New York City.
Delaware, Lackawanna & Western	W. F. Hallstead		Scranton, Pa.
Bloomsburg Division	G. Bogart		Scranton, Pa.
Morris & Essex Division	Andrew Reasoner		Hoboken, N. J.
Oswego & Syracuse Division	W. B. Phelps		Oswego, N. Y.
Utica, Chenango & Sus. Div	W. G. Oakman		Scranton, Pa.
Delaware Western	David Connell		Wilmington, Del.
Denver & Rio Grande	*D. C. Dodge		Denver, Col.
Denver & Rio Grande		A. B. Garner	Colorado Spr's, Col.
First Division	W. W. Hungerford		Denver, Col.
Second Division	E. R. Dougherty		La Veta, Col.
Des Moines, Northwestern	C. N. Gilmore		Des Moines, Iowa.
Des Moines & Ft. Dodge	C. N. Gilmore	C. N. Gilmore	Des Moines, Iowa.
Detroit & Bay City	S. R. Callaway	Allan Bourn	Detroit, Mich.
Detroit, Gr. Haven & Milwaukee	W. J. Morgan	John S. Lorimer	Detroit, Mich.
Detroit, Hillsdale & Southwestern	W. F. Parker		Ypsilanti, Mich.
Detroit, Lansing & Northern	J. M. Fish	Allan Bourn	Detroit, Mich.
Dorchester & Delaware	Tho. E. Wright		Cambridge, Md.
Dunkirk, Allegheny Val. & Pitts	D. Thayer		Dunkirk, N. Y.
Dunkirk, Allegheny Val. & Pitts		R. C. Moore	New York City.

E

Railroad.	Superintendent.	Purchasing Agent.	Residence.
East Broad Top	A. W. Sims		Orbisonia, Pa.
East Alabama	W. W. Barnes		Opelika, Ala.
East Line & Red River	W. B. Ward		Jefferson, Tex.
East Tenn., Virginia & Georgia	**J. F. O'Brien	J. F. O'Brien	Knoxville, Tenn.
Eastern	**D. W. Sanborn	Geo. J. Fisher	Boston, Mass.
Eastern Kentucky	H. W. Bates	H. W. Bates	Riverton, Ky.
Eastern Kentucky	Geo. Noble		Riverton, Ky.
Eastern Shore	W. Thompson		Prince Anne, Md.
Erie & Pittsburg	J. M. Kimball		Erie, Pa.
Erie & Pittsburg	*J. D. Layng	Wm. Mullins	Pittsburg, Pa.
Eureka & Palisade	P. Evarts		Palisade, Nev.
European & North American	F. W. Cram		Bangor, Maine.
Evansville & Terre Haute	J. E. Martin	Jno. L. White	Evansville, Ind.
Evansville, Terre Haute & Chi	Jos. Collett	W. D. Macfarland	Terra Haute, Ind.

F

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Fitchburg	John Adams	F. S. Pratt	Boston, Mass.
Vermont & Mass. Div	‡E. K. Turner		Fitchburg, Mass
Flint & Pere Marquette	Sanford Keeler	G. G. Cook	E Saginaw, Mich.
Florida Central	W. M. Davidson	W. M. Davidson	Jacksonville, Fla.
Flushing, North Shore & Central	Samuel Spencer	Samuel Spencer	L'g Isl'd C'y, N. Y.
Fonda, Johnstown & Gloversville	L. Caten		Gloversville, N. Y.
Fon du Lac, Amboy & Peoria	A. Kinyon		Fond du Lac, Wis.
Fort Madison & Northwestern	S. B. Kenrick	S. B. Kenrick	Fort Madison, Ia
Fort Wayne & Jackson	M. D. Woodford	M. D. Woodford	Jackson, Mich.
Fort Wayne, Muncie & Cincinnati	W. W. Worthington & P. Ag't		Fort Wayne, Ind.
Foxburg, St. Petersburg & Clarion	Benj. B. Newton		Foxburg, Pa.
Frankfort & Kokomo	J. B. Clark	E. H. Andress	Lafayette, Ind.
Fredericton	F. B. Edgecombe		Fredericton, N. B.
Freehold & New York	J. E. Ralph	J. E. Ralph	Freehold, N. J.

G

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Gal., Harrisburg & San Antonio	James Converse		Houston, Texas.
Gal., Houston & Henderson	*W. H. Harding	W. H. Harding	Palestine, Texas.
Geneva, Ithaca & Sayre	Wm. Stevenson		Sayre, Pa.
Georgia	S. K. Johnson	S. K. Johnson	Augusta, Ga.
Grand Haven	*F. H. May	F. H. May	Allegan, Mich.
G. Rapids, Newaygo & L. Shore	C. Warner		G. Rapids, Mich.
Grand Rapids & Indiana	W. O. Hughart, Pres't	W. R. Shelby	G. Rapids, Mich.
Northern Division	J. M. Matheany		G. Rapids, Mich.
Southern Division	P. S. O'Rourke		Fort Wayne, Ind.
Grand Trunk	*J. Hickson	John Taylor	Montreal, Canada.
Grand Trunk	W. J. Spicer		Montreal, Canada.
Grand Tower & Carbondale	T. M. Williamson	Wm. W. Harris	Grand Tower, Ill.
Grayville & Mattoon	*G. L. Bradbury		Mattoon, Ill.
Grayville & Mattoon	G. R. Cobleigh		Mattoon, Ill.
Great Western (Canada)	Charles Stiff		Hamilton, Ont.
Great Western (Canada)		G. R. Nash	London, Ont.
Green Bay & Minnesota	*Timothy Case		Green Bay, Wis.
Greenville, Col. & Birmingham	E. P. Buell		Greenville, Miss.
Greenwich & Johnsonville	J. H. Thompson		Greenwich, N. Y.
Gulf, Colorado & Santa Fé	*John Sealey	F. P. Killien	Galveston, Texas.
Gulf, Western Texas & Pacific	M. D. Monserrate		Cuero, Texas.

H

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Hamilton & Northwestern	*F. W. Cumberland		Hamilton, Ont.
Hannibal & St. Joseph	W. R. Woodard	T. L. Dunn	Hannibal, Mo.
Eastern Division	W. R. Woodard		Hannibal, Mo.
Western Division	W. C. Alberger		Kansas City, Mo.
Hanover Junction & Gettysburg	Henry A. Young		Hanover, Pa.
Harlem Extension South	*R. C. Root		Bennington, Vt.
Havana, Rantoul & Eastern	H. E. Bullock	H. E. Bullock	Rantoul, Ill.
Housatonic	L. B. Stillson		Bridgeport, Conn.
Houston, East & West Texas			Houston, Texas.
Houston & Texas Central	A. H. Swanson	A. H. Swanson	Houston, Texas.
Southern Division	M. G. Howe		Houston, Texas
Northern Division	G. A. Quinlan		Corsicana, Texas.
Huntingdon & Broad Top	Geo. F. Gage	S. B. Knight	Huntingdon, Pa.

I

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Illinois Central	E. T. Jeffrey	O. Ott	Chicago, Ill.
Chicago Division	C. A. Beck		Centralia, Ill.
Northern Division	J. C. Jacobs		Amboy, Ill.
Iowa Division	D. W. Parker		Dubuque, Ia.
Springfield Division	T. J. Hudson		Springfield, Ill.
Illinois Midland	L. Genis, *Rec*	J. G. Clifford	Terre Haute, Ind.
Illinois & St. Louis	C. H. Sharman		St. Louis, Mo.
Indiana, Bloomington & Western	§§C. E. Henderson	H. C. Norton	Indianapolis, Ind.
Indianapolis, Decatur & Spring.	E. H. Goodrich	E. H. Goodrich	Indianapolis, Ind.
Indianapolis & St. Louis	E. B. McClure	H. W. Comstock	Indianapolis, Ind.
Indianapolis, Peru & Chicago	§§E. C. Murphy		Indianapolis, Ind.
Indianapolis, Peru & Chicago		John Mc Kenna	Peru, Ind.
Indianapolis & Vincennes	J. J. Turner		Indianapolis, Ind
Intercolonial	D. Pottinger	T. V. Cooke	Moncton, N. B.
Halifax & St. John Division	Jas. Coleman		Truro, N. S.
Northern Division	M. Busby		Campbellt'n, N. B.
International & Great Northern	*H. M. Hoxie	H. M. Hoxie	Galveston, Texas.
Iowa Eastern	H. H. Kerr		Beulah, Iowa.

J

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Jacksonville, N. Western & S. E.	E. S. Greenleaf		Jacksonville, Ill.
Jacksonville, Pen. & Mobile		J. D. Hollister	Tallahassee, Fla.
Jeff., Madison & Indianapolis	E. W. McKenna		Louisville, Ky.
Jeff., Madison & Indianapolis		Wm. Mullins	Pittsburg, Pa.
Junction & Breakwater	Tho. Groome		Lewes, Del.

K

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Kansas Central	W. A. Martin	W. A. Martin	Leavenworth, Kan.
Kan. City, Burlington & Santa Fe	James Houston		Burlington, Kan.
Kansas City, Fort Scott & Gulf	L. W. Towne	H. P. Jacques	Kansas City, Mo.
Kansas City, Lawrence & South	L. W. Towne	H. P. Jacques	Kansas City, Mo.
Kan. City, St. Joseph & C. Bluffs	J. F. Barnard		St. Joseph, Mo.
Kansas Pacific	*S. H. H. Clark	A. D. Clark	Omaha, Neb.
Kansas Pacific	S. T. Smith		Kansas City, Mo.
Kaw Valley Division	J. O. Brinkerhoff		Kansas City, Mo.
Smoky Hill Division	J. T. Odell		Ellis, Kansas.
Denver Division	J. T. Odell		Denver, Col.
Cheyenne Division	A. A. Egbert		Denver, Col.
Kent Co. & Smyrna & Del. Bay	J. F. Bingham		Chestertown, Md.
Kentucky Central	J. R. Ledyard		Covington, Ky.
Kingston & Pembroke	B. W. Folger	Wm. Harty	Kingston, Can.
Knox & Lincoln	C. A. Coombs	C. A. Coombs	Bath, Maine.
Knoxville & Ohio	G. J. Kinzel		Knoxville Tenn.

L

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Lake Erie & Western	*E. H. Waldron	E. H. Andress	Lafayette, Ind.
Sandusky Division	D. S. Hill		Fremont, Ohio.
Bloomington Division	M. Clark		Lafayette, Ind.
Lake Ontario Southern	*Jas. E. Briggs		Newark, N. Y.
Lake Shore & Mich. Southern	*John Newell		Cleveland, Ohio.
Lake Shore & Mich. Southern	Charles Paine	A. C. Armstrong	Cleveland, Ohio.
Buffalo & Erie Division	C. B. Couch		Cleveland, Ohio.
Toledo Division	Thos. Flesher, Jr		Cleveland, Ohio.
Michigan Division	J. E. Curtis		Toledo, Ohio.
Detroit Division	T. J. Charlesworth		Detroit, Mich.
Western Division	J. H. Parsons		Chicago, Ill.
Lansing Division	W. H. Caniff		Lansing, Mich.
Franklin Division	Geo. H. McIntire		Stoneboro, Pa.
Lehigh Valley	Robert H. Sayre		Bethlehem, Pa.
Lehigh Valley		L. Chamberlin	Philadelphia, Pa.
Beaver Meadow Division	A. G. Brodhead, Jr		Mauch Chunk, Pa
Mahanoy Division	James I. Blakslee		Mauch Chunk, Pa.
New Jersey Division	H. E. Packer		Metuchen, N. J.
Wyoming Division	A. Mitchell		Wilkesbarre, Pa.
Levis & Kennebec	W. C. Hall		Quebec, Can.
Ligonier Valley	Thos. A. Mellon		East Liberty, Pa.
Little Rock & Fort Smith	T. Hartman		Little Rock, Ark.
Little Rock, Miss. River & Texas	J. A. Woodson	J. A. Woodson	Pine Bluff, Ark.
Los Angeles & Independence	§W. J. L. Moulton		Los Angeles, Cal.
Long Island	T. R. Sharp, Rec		L'g Isla'd C'y, N.Y.
Louisiana Western	G. W. Polk		Lake Charles, La.
Louisville & Nashville	*F. de Funiak		Louisville, Ky.
Louisville & Nashville	D. W. C. Rowland	Jas. Geddes	Louisville, Ky.
St. L. & S. E. & N. & D. Div	James Montgomery		Evansville, Ind.
Memphis Line	J. T. Harrahon		Memphis, Tenn.
Nashville & Decatur Div	James Geddes		Nashville, Tenn.
So. & North Ala. Division	B. Dunham		Birmingham, Ala.
Louisville, Cincinnati & Lexington	Wm. Mahl	Wm. Mahl	Louisville, Ky.
Louisville, New Albany & Chicago	John McLeod	Wm. M. Lewis	Louisville, Ky.
Louisville, N. Albany & St. Louis	H. L. Shepherd		New Albany, Ind.

M

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Macon & Brunswick	Jas. M. Edwards	W. C. Jones	Macon, Ga.
Maine Central	Payson Tucker		Portland, Me.
Manchester & Lawrence	H. E. Chamberlin		Concord, N. H.
Manchester & North Weare	H. E. Chamberlin		Concord, N. H.
Manhattan Beach	A. Corbin, *Pres't*		New York, N. Y.
Manhattan Elevated	§§Frank K. Hain		New York, N. Y.
Manhattan Elevated	C. L. Green		New York, N. Y.
Marietta & Cincinnati	Jas. H. Stewart	J. H. Stewart	Cincinnati, O.
Marquette, Hought'n & Ontonag'n	*Samuel Schoch	R. M. McCauley	Marquette, Mich.
McKean & Buffalo	S. V. Godden		Smethport, Pa.
Memphis & Little Rock	*Wm. E. Smith		Memphis, Tenn.
Memphis & Little Rock	E. K. Sibley		Memphis, Tenn.
Memphis & Charleston	John A. Grant	John A. Grant	Huntsville, Ala.
Memphis, Paducah & Northern	*N. Monsarrat	N. Monserrat	Paducah, Ky.
Michigan Air Line	*M. S. Hadley		Romeo, Mich.
Michigan Central	*H. B. Ledyard	Allan Bourn	Detroit, Mich.
Michigan Central	‡E. C. Brown		Jackson, Mich.
Mackinaw & Saginaw Div	W. A. Vaughan		Bay City, Mich.
Main L'e & G. R. & Kal. Div's	C. B. Bush		Jackson, Mich.
Middleburg & Schoharie	P. S. Demforth		Middleburg, N. Y.
Middletown & Crawford	D. Thompson		[Thompson, Ridge, N.Y
Midland of New Jersey	*H. M. Britton		Jersey City, N. J.
Midland Railway of Canada	H. G. Taylor		Port Hope, Ont.
Milwaukee, Lake Shore & West'n	H. G. H. Reed		Milwaukee, Wis.
Mineral Point	G. W. Cobb	G. W. Cobb	Mineral Point, Wis.
Mineral Range	*C. E. Holland		Hancock, Mich.
Minneapolis & St. Louis	*Chas. F. Hatch	Chas. F. Hatch	Minneapolis, Minn
Minnesota Midland	J. H. Lakey		Wabasha, Minn.
Mississippi & Tennessee	M. Burke	M. Burke	Memphis, Tenn.
Missouri Pacific	A. A. Talmage	R. B. Lyle	St. Louis, Mo.
Missouri Pacific	‡A. W. Dickinson		St. Louis, Mo.
Eastern Division	Miller Bullard		St. Louis, Mo.
Central Branch Division	W. W. Fagan		St. Louis, Mo.
Western Division	Warder Cumming		Sedalia, Mo.
Mobile & Alabama Grand Trunk	F. B. Clark, Prest		Mobile, Ala.
Mobile & Ohio	*A. L. Rives	A. L. Rives	Mobile, Ala.
Northern Division	E. S. Hosford		Jackson, Tenn.
Southern Division	C. Fleming		Mobile, Ala.
Mobile & Girard	W. L. Clark		Columbus, Ga.
Mobile & Montgomery	B. Dunham		Montgomery, Ala.
Mont Alto	G. B. Weistling		Mont Alto, Pa.
Montgomery & Eufaula	W. G. Raoul		Macon, Ga.
Montpelier & Wells River	W. A. Stowell		Montpelier, Vt.
Montrose	J. I. Blakslee	J. I. Blakeslee	Mauch Chunk, Pa
Morgan's Louisiana & Texas	Geo. Pandeley	C. A. Whitney & Co.	New Orleans
Muncy Creek	H. R. Mehrling		Hughesville,

N

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Nashua, Acton & Boston	H. E. Chamberlin		Concord, N. H
Nashua & Lowell	Chas. E. Paige	Chas. E. Paige	Nashua, N. H.
Nashville, Chattanooga & St. Louis	J. W. Thomas		Nashville, Tenn

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Natchez, Jackson & Columbus	J. H. Fitzpatrick		Natchez, Miss.
Naugatuck	Geo. W. Beach	Geo. W. Beach	Waterbury, Conn.
Nebraska	Wm. Irving		Omaha, Neb.
Nevada Central	*Jos. Collett	F. W. Dunn	Battle Mountain, Nev.
Newburg, Dutchess & Connecticut	C. L. Kimball	C. L. Kimball	Dutchess J'n, N.Y.
New Brunswick & Canada	John Stewart		St. Stephen, N. B.
New Brunswick	E. B. Burpee	T. Burpee	Gibson, N. B.
New Canaan	Wm. St. John		New Canaan, Conn.
New Castle & Franklin	A. Vandivort		New Castle, Pa.
New Haven & Derby	E. S. Quintard		New Haven, Conn.
New Haven & Northampton	C. N. Yeamans	C. N. Yeamans	New Haven, Conn.
New Jersey & New York	J. D. Hasbrouck		Jersey City, N. J.
New Jersey Southern	Rufus Blodgett		110 Lib. st., N. Y.
New Orleans & Selma	T. H. Du Puy		Selma, Ala.
New Orleans, Texas & Mobile	D. B. Robinson	John J. Howell	New Orleans, La.
New York, Lake Erie & Western	*Robert Harris		New York, N. Y.
New York, Lake Erie & Western	E. S. Bowen	J. A. Hardenbergh	New York, N. Y.
New York, Lake Erie & Western	†O. Chanute		New York, N. Y.
New York, Lake Erie & Western	*†P. P. Wright		Jersey City, N. J.
Eastern Division	E. O. Hill		Port Jervis, N. Y.
Delaware Division	Benj. Thomas		Port Jervis, N. Y.
Susquehanna Division	R. R. Cable		Elmira, N. Y.
Buffalo & Rochester Div	R. G. Taylor		Buffalo, N. Y.
Western Division	J. S. Beggs		Dunkirk, N. Y.
New York & Greenwood Lake	Wm. P. Harris		Jersey City, N. J.
New York, New Haven & Hartford	*E. M. Reed	R. N. Dowd	New Haven, Conn.
N. Y. & N. H. Division	John T. Moody		New York, N. Y.
Hartford Division	C. S. Davidson		Hartford, Conn.
Shore Line Division	W. H. Stevenson		New Haven, Conn.
New York Central & Hudson Riv			
Hudson River & Harlem Div	J. M. Toucey	R. C. Moore	New York, N. Y.
Eastern Division	Zenas C. Priest		Utica, N. Y.
Western Division	Geo. H. Burrows		Rochester, N. Y.
New York Central Division	Jas. Tillinghast		Albany, N. Y.
New York & Harlem	Chas. M. Bissell	R. C. Moore	New York, N. Y.
New York & New England	*Jas. H. Wilson	W. W. McKim	Boston, Mass.
Eastern Division	O. M. Shepard		Boston, Mass.
Norwich Division	P. St. M. Andrews		Norwich, Conn.
Western Division	J. T. McManus		Hartford, Conn.
Providence Division	L. W. Palmer		Providence, R. I.
New York, Ontario & Western	*Theo. Huston		New York, N. Y.
New York, Ontario & Western	N. R. Hankin	Charles Clark	Middletown, N. Y.
Northern Division	C. W. Lanpher		Norwich, N. Y.
Southern Division	A. H. Danforth		Middletown, N. Y.
New York, Penn. & Ohio	P. D. Cooper	J. H. Holway	Cleveland, O.
First & Second Divisions	A. L. Dunbar		Meadville, Pa.
Third and Fourth Divisions	T. A. Phillips		Galion, O.
Mahoning Division	M. Ferris		Cleveland, O.
Northern Pacific	*H. E. Sargent	E. T. Williams	St. Paul, Minn.
Northern Pacific	H. A. Towne		Brainerd, Minn.
Pacific & P. Oreille Div	J. W. Sprague	J. W. Sprague	New Tacoma, W. T.
Missouri Division	D. R. Taylor		Mandon, Dak.
Northern of Canada	*F. W. Cumberland		Toronto, Can.
North Carolina	See Piedmont Air-Line.		
Northern Central	*Frank Thomson		Philadelphia, Pa.
Northern Central		A. W. Sumner	Baltimore, Md.
Baltimore Division	G. C. Wilkins		Baltimore, Md.
Elmira & Canandaigua Div	R. Neilson		Elmira, N. Y.
Susquehanna Division	W. A. Baldwin		Williamsport, Pa.
Northern (New Hampshire)	George F. Todd		Concord, N. H.
Northeastern (Georgia)	Lyman Wells		Athens, Ga.
Northeastern (South Carolina)	J. F. Devine		Charleston, S. C.
North Pacific Coast	W. C. Fillmore	W. F. Russell	San Francisco, Cal.
Northwestern Ohio	J. S. Morris		Toledo, O.
Northern & Northwestern	Jas. Webster		Toronto, Can.

O

Ogdensburg & Lake Champlain	A. Klohs		Malone, N. Y.
Ohio Central	*G. G. Hadley		Columbus, O.
Ohio & Mississippi	W. W. Peabody	G. E. Atwood	Cincinnati, O.
Eastern Division	C. B. Cole		Seymour, Ind.
Western Division	C. M. Stanton		St. Louis, Mo.
Louisville Division	C. Cole		Louisville, Ky.
Old Colony	J. R. Kendrick	F. P. Moseley	Boston, Mass.
Northern Division	§S. A. Webber		Fitchburg, Mass.
Cape Cod Division	§C. H. Nye		Hyannis Mass.
Main Line Division	§J. H. French		Boston, Mass.
Olean, Bradford & Warren	J. W. Watson		Olean, N. Y.
Olean Bradford & Warren		J. H. Poole	Buffalo, N. Y.
Omaha & Republican Valley	P. J. Nichols		Omaha, Neb.
Omaha & Northern Nebraska	J. E. House		Omaha, Neb.
Oregon & California	J. Brandt, Jr.	J. Brandt, Jr.	Portland, Oregon.
Oregon Railway & Navigation Co.	G. J. Ainsworth		Portland, Oregon.
Owensboro & Nasaville	L. Culverhouse		Owensboro, Ky.

P

Paducah & Elizabethtown	Robert Meek		Elizabethtown, Ky.
Painesville & Youngstown	*†J. A. Newcome		Youngstown, O.
Parker & Karns City	W. C. Moberly		Parker City, Pa.
Peach Bottom	S. M. Manifold		York, Pa.
Paw Paw & Toledo & South Haven	John Ihing		Lawton, Mich.
Pennsylvania	*Frank Thomson	Enoch Lewis	Philadelphia, Pa.
Pennsylvania	Charles E. Pugh		Altoona, Pa.
Pennsylvania	**John Reilly		Altoona, Pa.
New York Division	James McCrea		Jersey City, N. J.
Amboy Division	I. S. Buckelew		Camden, N. J.
Belvidere Division	J. A. Anderson		Lambertville, N. J.
New Jersey Division	F. Wolcott Jackson		Jersey City, N. J.
Philadelphia Division	W. F. Lockard		Philadelphia, Pa.
Middle Division	S. M. Prevost		Harrisburg, Pa.
Pittsburg Division	Robert Pitcairn		Pittsburg, Pa.
Tyrone Division	S. S. Blair		Tyrone, Pa.
Bedford Division	Thos. A. Roberts		Harrisburg, Pa.
West Pennsylvania Division	E. B. Taylor		Allegheny City, Pa.
Lewistown Division	J. H. Hutchinson		Lewistown, Pa.
Pensacola & Selma	W. D. Chipley		Pensacola, Fla.
Peoria, Decatur & Evansville	G. R. Cobleigh	G. R. Cobleigh	Peoria, Ill.
Peoria & Jacksonville	*Geo. Skinner	Geo. Skinner	Peoria, Ill.
Peoria & Springfield	J. R. Hilliard		Peoria, Ill.
Petersburg	R. Sully	L. E. Clark	Petersburg, Va.
Philadelphia & Atlantic City	Ellis Clark		Philadelphia, Pa.
Philadelphia & Atlantic City	*Wm. Robinson		Bakersville, N. J.
Philadelphia & Atlantic City		J. W Wright	Camden, N. J.
Philadelphia & Reading	*J. E. Wootten	W. S. Wilson	Philadelphia, Pa.
Catawissa & Williamsport Br.	D. C. Reinhart		Williamsport, Pa.
Reading & Columbia	Alex. M. Wilson		Columbia, Pa.
Lebanon & Tremont	H. W. Tracy		Pine Grove, Pa.
N. Penn. & B. Brook Divis'n.	E. A. Sweigard		Philadelphia, Pa.
Philadelphia & Baltimore Central	Henry Wood	Henry Wood	Philadelphia, Pa.
Philadelphia & Erie	Wm. A. Baldwin		Williamsport, Pa.
Philadelphia & Erie		Enoch Lewis	Philadelphia, Pa.
Western Division	J. W. Reynolds		Erie, Pa.
Middle Division	E. B. Westfall		Renovo, Pa.
Eastern Division	Thomas Gucker		Williamsport, Pa.
Danv., Haz. & W. Barre Div	Joseph Crawford		Sunbury, Pa.
Philadelphia, Wilmington & Balt	H. F. Kenney		Philadelphia, Pa.
Philadelphia, Newt'n & New York	L. L. Bush		Philadelphia, Pa.
Piedmont Air-Line	T. M. R. Talcott	R. H. Duesberry	Richmond, Va.
Richmond & Danville Div	W. A. Green		Richmond, Va.
North Carolina Division	A. B. Andrews		Raleigh, N. C.
Pine River Valley & Stevens Pt	N. L. James		Richl'nd Cent., Wis.

Railroad.	Superintendent.	Purchasing Agent.	Residence.
Pittsburg & Castle Shannon	A. C. Hays		Pittsburg, Pa.
Pittsburg & Lake Erie	R. W. Jones		Pittsburg, Pa.
Pittsburg, Cincinnati & St. Louis	S. M. Felton, Jr.	William Mullins	Pittsburg, Pa.
Pittsburg, Cincinnati & St. Louis	*D. W. Caldwell		Columbus, O.
Pitts., Cin. & St. Louis Div	J. H. Barrett		Pittsburg, Pa.
Col., Cin. & Ind., Cent. Div	J. Hill		Logansport, Ind.
Col., Cin. & Ind., Cent. Div	J. F. Miller		Richmond, Ind.
Indianap. & Vincennes Div	E. W. McKenna		Indianapolis, Ind.
Cincin. & Musk. Valley Div	C. C. Waite		Zanesville, O.
Little Miami Div	J. D. Ellison		Cincinnati, O.
Pittsburg, Ft. Wayne & Chicago	*J. D. Layng	William Mullins	Pittsburg, Pa.
Pittsburg, Ft. Wayne & Chicago	†C. E. Gorham		Chicago, Ill.
Eastern Division	George S. Griscom		Pittsburg, Pa.
Western Division	C. D. Gorham		Fort Wayne, Ind.
Pittsburg & Western	J. A. Banner		Harmony, Pa.
Pittsburg, Titusville & Buffalo	Tho. H. Wilson		Oil City, Pa.
Pittsburg, Titusville & Buffalo		John L. Awl	Pittsburg, Pa.
Pittsburg, Virginia & Charleston	J. M. Byers		Pittsburg, Pa.
Port Dover & Lake Huron	A. B. Atwater		Woodstock, Ont.
Port Royal & Augusta	R. G. Fleming		Port Royal, S. C.
Portland & Ogdensburg	Jonas Hamilton	Jonas Hamilton	Portland, Me.
Portland & Rochester	G. P. Wescott, *Rec*		Portland, Me.
Potomac, Fredericksb'h & Pied't	Charles Kennedy		Predericksb'h, Va.
Poughkeepsie, Hartford & Boston	J. A. Perkins	A. W. Cable	Poughkeepsie, N. Y.
Prince Edward Island	L. B Archibald	L. B. Archibald	Charlottetn, P. E. I.
Prospect Park & Coney Island	R. Schermerhorn		Coney Island, N. Y.
Providence & Springfield	William Tinkham	William Tinkham	Providence, R. I.
Providence & Worcester	W. E. Chamberlain		Providence, R. I.
Providence, Warren & Bristol	Waterman Stone		Providence, R. I.

Q

Quebec, Mont., Ott'a & Occidental	L. A. Senecal	W. E. Blumhart	Montreal, Can.
Quebec Central	A. Steele		Sherbrooke, Can.
Queen Anne & Kent County	P. H. Irwin		Centreville, Md.
Quincy, Missouri & Pacific	F. D. Schermerhorn		Quincy, Ill.

R

Raleigh & Augusta Air-Line	J. C. Winder		Raleigh, N. C.
Raleigh & Gaston	J. C. Winder		Raleigh, N. C.
Rhinebeck & Connecticut	J. H. Jones		Rhinebeck, N. Y.
Richmond, York Riv. & Ches'p'ke	H. T. Douglas	B. S. Crouch	Richmond, Va.
Richmond & Petersburg	*Decatur Axtell		Richmond, Va.
Richm'nd & Danville	(See Piedmont Air-Line).		
Richmond, Frederick'h & Potomac	E. T. D. Myers	T. L. Courtney	Richmond, Va.
Richmond & Petersburg	Theo. D. Kline		Richmond, Va.
Rio Grande	*M. J. Gomila		Brownsville, Tex.
Rochester & State Line	J. E. Childs	J. E. Childs	Rochester, N. Y.
Rockwood & Tennessee River	H. Clay Evans		Rockwood, Tenn.
Rock Island & Mercer County	*R. R. Cable		Rock Island, Ill.
Rock Island & Peoria	R. R. Cable	R. R. Cable	Rock Island, Ill.
Rome	Eben Hillyer		Rome, Ga.
Rome, Watertown & Ogdensburg	E. A. Van Horne		Watertown, N. Y.
Rome, Watertown & Ogdensburg		G. W. B. Cushing	New York City.
Rumford & Buckfield	O. Havford		Canton, Me.

S

Scioto Valley	Joseph Robinson		Columbus, O.
Sciota Valley		C. H. Cory	Portsmouth, O.
St. Croix & Penobscot	Wallace Haycock		Milltown, Me.
St. Lawrence & Ottawa	*Tho. Reynolds	Tho. Reynolds	Ottawa, Can.
St. Johns	R. McLaughlin		Jacksonville, Fla.
St. Johns & Indian River	W. H. Churchill		Titusville, Fla.
St. John & Maine	H. D. McLeod		St. John, N. B.
St. Johnsbury & Lake Champlain	A. B. Jewett		St. Johnsbury, Vt
St. Joseph & Des Moines	J. F. Barnard		St. Joseph, Mo.
St. Joseph & Western	L. D. Tuthill		St. Joseph, Mo.
St. Joseph & Western		A. D. Clarke	Omaha, Neb.
St. Louis, Alton & Terre Haute	Beriah Warren	Beriah Warren	St. Louis, Mo.
St. Louis, Hannibal & Keokuk	W. W. Walker		Hannibal, Mo.
St. Louis, Iron Mountain & South	Arthur W. Soper	W. S. Cuddy	St. Louis, Mo.
Texas Division	J. W. Brown		Texas, Texas
Missouri Division	Wm. Kerrigan		St. Louis. Mo.
St. Louis & San Francisco	*C. W. Rogers	C. W. Rogers	St. Louis, Mo.
Kansas Division	W. A. Thous		Oswego, Kan.
St. Louis, Keokuk & Northwest'n	A. L. Griffin	John A. Blood	Keokuk, Ia.
St. Louis, Salem & Little Rock	E. B. Sankey		Salem, Mo.
St. Louis, Salem & Little Rock		H. A. Crawford	St. Louis, Mo.
St. Louis Bridge Co. & Tunnel R.R.	J. B. Van Dyne	J. E. Williams, Jr.	St. Louis, Mo.
St. Paul & Duluth	Geo. H. Smith		St. Paul, Minn.
St. Paul, Minneapolis & Manitoba	*Jas. J. Hill	J. C. Morrison	St. Paul, Minn.
St. Paul, Minneapolis & Manitoba	E. B. Wakeman		St. Paul, Minn.
St. Paul & Sioux City	E. W. Winter		St. Paul, Minn.
St. Paul, Stillwater & Taylor's Falls			St. Paul, Minn.
Sacramento & Placerville	Josiah Johnson		Sacramento, Cal.
Saginaw Valley & St. Louis	N. W. Merrill	N. W. Merrill	Saginaw, Mich.
San Francisco & North Pacific	*A. Hughes	A. Hughes	San Francisco, Cal.
San Francisco & North Pacific	H. C. Whiting	P. E. Dougherty	Petaluma, Cal.
San Rafael & San Quentin	David Nye		San Rafael, Cal.
Savannah, Florida & Western	*H. S. Haines	W. B. McKee	Savannah, Ga.
Savannah & M-mphis	*G. J. Foreacre		Atlanta, Ga.
Seaboard & Roanoke	J. M. Robinson	J. A. Walton	Baltimore, Md.
Selma & Greensboro	A. M. Fowlkes		Selma, Ala.
Selma, Rome & Dalton	*J. F. O'Brien		Selma, Ala.
Sheboygan & Fond du Lac	E. J. Cuyler		Fond du Lac, Wis.
Shenango & Allegheny	J. T. Blair		Greenville, Pa.
Shepaug	C. H. Platt		Litchfield, Conn.
Sioux City & Pacific	F. C. Hills		Missouri Valley, Ia.
Sioux City & Pacific	*P. E. Hall	P. E. Hall	Cedar Rapids, Ia.
Skaneateles	J. McKeehan		Skaneateles, N. Y.
South Carolina	John B. Peck	S. B. Pickens	Charleston, S. C.
Southeastern of Canada	H. A. Alden		Newport, Vt.
Southern Central	Jas. G. Knapp		Auburn, N. Y.
South Mountain	W. H. Woodward		Pine Grove Furnace, Pa.
Southern Pacific	A. C. Bassett	John R. Watson	San Francisco, Cal.
Los Angeles & Yuma Div	E. E. Hewitt		Los Angeles, Cal.
Tulare Division	A. D. Wilder		Oakland, Cal.
South Pacific Coast	F. W. Bowen		San Francisco, Cal.
Southwestern of Georgia	W. G. Raoul		Macon, Ga.
Southwestern of Kentucky	M. Tabler		Harrodsburg, Ky.
Spartanburg, Union & Columbia	Jas. Anderson	Jas. Anderson	Spartanburg, S. C.
Spartanburg & Asheville	Jas. Anderson	Jas. Anderson	Spartanburg, S. C.
Springfield, Athol & Northeastern	John W. Phelps		Springfield, Mass.
Springfield & Northwestern	E. B. Hyde	E. B. Hyde	Springfield, Ill.
Springfield Southern	Wm. Thornburg	G. A. Barnes	Springfield, O.
Springhill & Parsboro	J. A. Kilham		Parsboro, N. S.
State Line & Sullivan	J. O. Blight		Towanda, Pa.
Staten Island	John W. Wilber		Tottenville, N. Y.
Sterling Mountain	J. C. Missimer		Shokan, N. Y.
Stonington & Providence	J. B. Gardiner		Providence, R. I.
Stonington & Providence		Giles F. Ward	Stonington, Conn.
Summit Branch	R. C. Peebles		Lykens, Pa.
Summit County	W. M. Riter		Coalville, Utah.
Sussex	E. C. Case	E. C. Case	Newtown, N. J.
Syracuse, Binghamton & N. Y.	W. K. Niver		Syracuse, N. Y.
Syracuse, Binghamton & N. Y.		G. W. B. Cushing	New York, N. Y.
Syracuse, Chenango & New York	Albert Allen		Syracuse, N. Y.
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Terre Haute & Southeastern	George Atherton		Terre Haute, Ind.
Texas & New Orleans	C. A. Burton	P. B. Watson	Houston, Tex.
Texas & Pacific	Geo. Noble	C. C. Commisky	Marshall, Tex.
Jefferson Division	J. S. Noble		Texarkana, Tex.
Southern Division	C. Harris		Marshall, Tex.
Texas Western	J. W. Goodwin		Houston, Tex.
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Tioga	L. H. Shattuck		Blossburg, Pa.
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Dayton Division	J. O. Arnold		Dayton, Ohio
Toledo & Ann Arbor	J. S. Morris		Ann Arbor, Mich.
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Toronto, Grey & Bruce	*Edmund Wragge	W. Watson	Toronto, Can.
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U			
Ulster & Delaware	Geo. Covkendall		Rondout, N. Y.
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Union Pacific	Silas T. Clarke		Omaha, Neb.
Eastern Division	F. J. Nichols		Omaha, Neb.
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Laramie Division	Edw. Dickinson		Laramie, Wy. T.
Colorado Division	A. A. Egbert		Denver, Col.
Kansas Division	S. T. Smith		Kansas City, Mo.
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Vicksburg & Meridian	E. F. Raworth	E. F. Raworth	Vicksburg, Miss.
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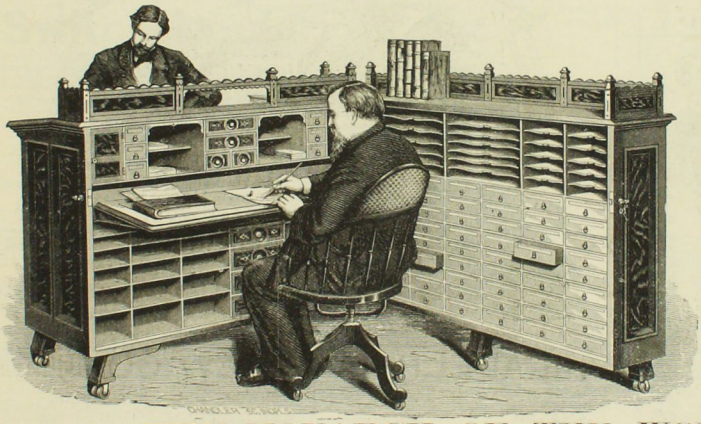

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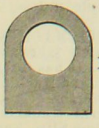

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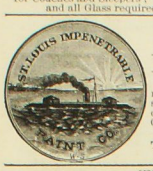

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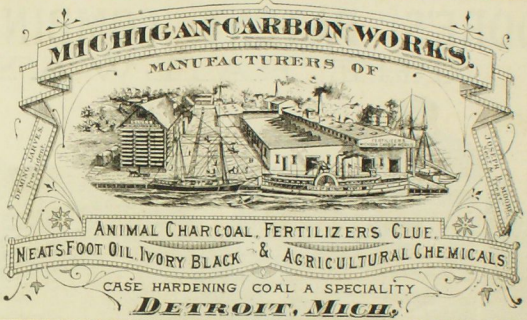

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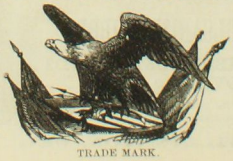
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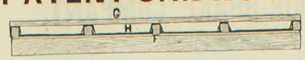

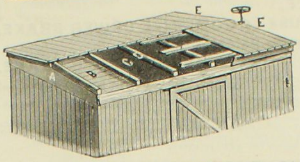

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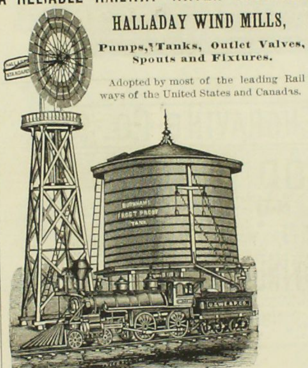

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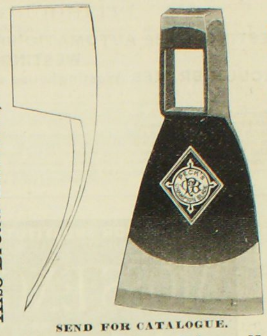

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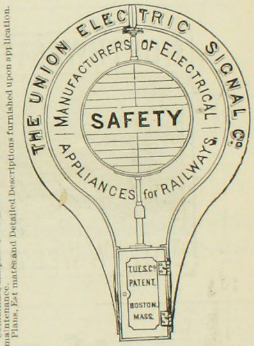

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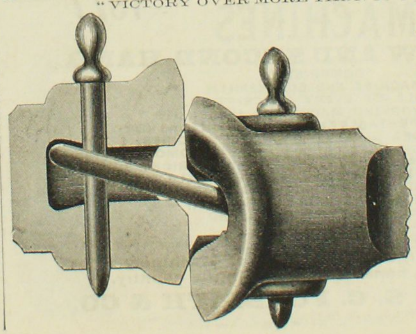

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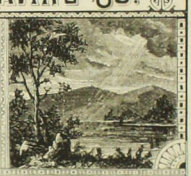

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☞ Send stamp for same.] In our List No. 23. [stating what you want. ☜

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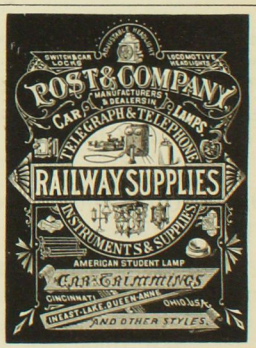

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L. G. TILLOTSON & CO.,

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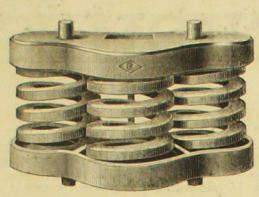

WIDTH, - - - - - - - 11½ INCHES
HEIGHT, - - - - - - - 6¼ INCHES
WEIGHT, - - - - - - - 40 POUNDS
CAPACITY OF EACH SPRING, 18,000 POUNDS

REPRESENTED BY
CURRAN DINSMORE,
AND
CHARLES D'W. GIBSON,
NO. 5 DEY ST., NEW YORK.

NATIONAL
Car Spring Company,

RICHARD VOSE, President.

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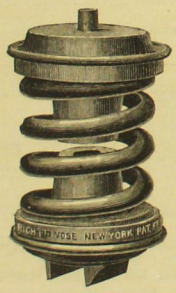
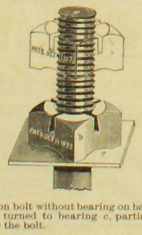
VOSE GRADUATED EQUALIZER RUBBER CONE.



Adapted to a Car Body Weighing 30,000 Lbs.
Diameter outside Casing, 8 in.
Height, Bearing to Bearing, 11¼ in.

Atwood Safety Nut Co.,
Springfield, Mass.



J. W. LARABEE, Treasurer.

a, ATWOOD NUT on bolt without bearing on base—slots open. *b*, ATWOOD NUT turned to bearing *c*, partially closing the slots and grasping the bolt.

CULMER SPRING CO.

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BAR, NEST AND SPIRAL SPRINGS,
FROM BEST CAST STEEL,
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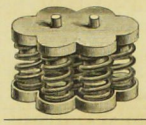

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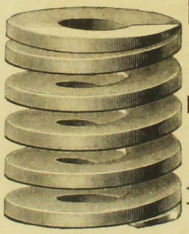
Edge-Rolled, Equal Bar Nest, and other Spiral Car Springs of Approved Patterns, from Crucible Cast Spring Steel.



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FINE TOOL STEEL
ARE WARRANTED EQUAL IN QUALITY AND IN UNIFORMITY OF TEMPER TO ANY STANDARD BRANDS OF FOREIGN PRODUCTION.

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1,232 MARKET ST., Philadelphia. 178½ WATER ST., New York.
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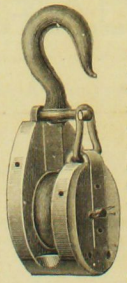
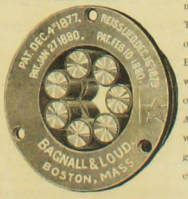


STAR ROLLER.



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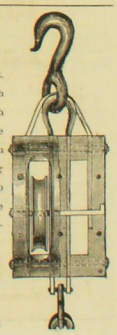

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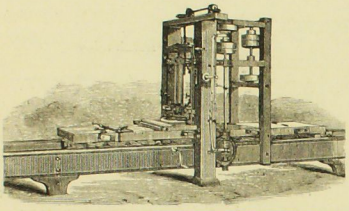

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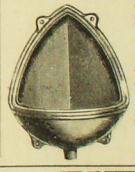

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